CITY
ENGINEERING COLLEGE

DEPARTMENT OF BASIC SCIENCE

ACADEMIC YEAR 21-22 EVEN SEMESTER

CIRCULAR

Ref No: CEC/BS/DAC/ACY/2021-22/OR/01 Date: 02-06-2022

This is to inform the members of Department Advisory Committee that meeting is scheduled on 04-06-2022 at 10: 00 AM in Physics Laboratory.

Agenda:

- Commencement of classes for 2nd semester students
- Phase II Student Induction Programme for 2nd semester students
- Conduction of Talents Day
- Organizing Battle of Science- Project Exhibition
- Organizing value added courses/ circular courses in the curriculum
- Organizing FDP

HOD
Dr. K Sujatha
Department of Physics

HEAD OF THE DEPT. OF PHYSICS
CITY ENGINEERING COLLEGE,
Doddakallasandra, Kanakapura Main Road,
BANGALORE - 560 062.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF BASIC SCIENCE

Department Advisory Committee Meeting

Date: 04-06-2022
Time: 10:00 AM
Venue: Physics Laboratory

DAC Members Present:

Sl. No	Member Name	Designation	Role	Signature
1	Dr. P. Rajasekar	HOD & Professor	Convenor	
2	Mrs. Sunitha N	Assistant Professor	Member	
3	Mrs. Anu Radha U	Assistant Professor	Member	
4	Mrs. Sowmya P	Assistant Professor	Member	
5	Dr. K Sujatha	HOD & Professor	Member	
6	Mrs. Nagasree G	Assistant Professor	Member	
7	Mrs. Ashwini Hindiholi	Assistant Professor	Member	
8	Dr. Jyothi P	Associate Professor	Member	
9	Vanitha G R	Assistant Professor	Member	
10	Mrs. Gayatri annasagaram	Assistant Professor	Member	
11	Mrs. Kalavathi	Assistant Professor	Member	
12	Mrs. Gana Priya	Assistant Professor	Member	
13	Mrs. Reena Patro	Assistant Professor	Member	

Agenda of the Meeting:

- Commencement of classes for 2nd semester students
- Phase II Student Induction Programme for 2nd semester students
- Conduction of Talents Day
- Organizing Battle of Science- Project Exhibition
- Organizing value added courses/ certificate courses in the curriculum
- Organizing FDP

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

Minutes of Meeting:

The members discussed suggestions for improvement and reviewed the meeting agenda.

- Battle of Science is a project exhibition focuses on displaying interests and diverse projects.
- Discussed about a location with enough space for display of projects and ECE laboratory are chosen for exhibition.
- Setting up a registration process for participants.
- Providing certificates to all participants and cash prize for winners.
- Value added course on public speaking skills to be organized.

Convenor
Dr. Rajasekhar. P
Department of Chemistry

Dr P. RAJASEKHAR,
M.Sc; M.Phil; Ph.D
HEAD OF THE DEPT. OF CHEMISTRY
CITY ENGINEERING COLLEGE
Doddakallasandra, Kanakapura Main Road
BANGALORE - 560 062.
Ph (O) 26669313 (M) 92428 92734

HOD
Dr. K Sujatha
Department of Physics

HEAD OF THE DEPT. OF PHYSICS
CITY ENGINEERING COLLEGE,
Doddakallasandra, Kanakapura Main Road,
BANGALORE - 560 062.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ
ಎತಾಯು ಅಧಿನಿಯಮ್ ೧೯೯೪ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ
"ಜ್ಞಾನ ಸಂಗಮ" ಮಚ್ಛೆ, ಬೆಳಗಾವಿ-590018

Visvesvaraya Technological University
(The State University of Govt. Karnataka, Established as per VTU Act 1994)
"JnanaSangama" Machhe, Belagavi-590018, www.vtu.ac.in

Dr. A. S. Deshpande B.E., Tech., Ph.D.
Registrar

Phone: (0831) 2498100
Fax: (0831) 2405467

Ref. No. VTU/BGM/BOS/2021-22/ 2759 Date: 22 AUG 2022

Revised-NOTIFICATION

Subject: -Revised Academic Calendar of Even semesters B.E./B.Tech./B.Plan./B.Arch. programs of University regarding...
Reference: Hon'ble Vice-Chancellor's approval dated: 22.08.2022

The revised academic calendar concerned to **even semesters of B.E./B.Tech./B.Plan./B.Arch.** programs of University are hereby notified as mentioned in the attached sheet;

The Principals of Affiliated, Constituent and Autonomous Engineering Colleges are hereby informed to bring the revised academic calendar to the notice of all concerned.

Encl: As mentioned

Sd/-
REGISTRAR

To,

1. The Principals of all affiliated/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering and Business Studies of the University.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director I/c. ITI SMU, VTU Belagavi for information and to make arrangements to upload revised Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. PS to Registrar VTU Belagavi
7. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi

22/8/2022
REGISTRAR

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Revised - Academic Calendar for EVEN Semester of UG programs for the year 2021-22

	VI semester B.E./B.Tech.	VI semester B.Arch.	VI semester B.Plan	VIII sem B.Arch	IV Semester B.Arch.	IV semester B. Plan	II semester B.E./B.Tech.	II semester B.Arch/B.Plan
Commencement of EVEN Semester	04.04.2022	04.04.2022	04.04.2022	04.04.2022	11.04.2022	11.04.2022	06.06.2022	06.06.2022
Last Working day of EVEN Semester	16.07.2022	16.07.2022	16.07.2022	23.07.2022	23.07.2022	23.07.2022	09.09.2022	09.09.2022
Practical/Viva-Examination	18.07.2022 To 29.07.2022	18.07.2022 To 29.07.2022	18.07.2022 To 29.07.2022	25.07.2022 To 30.07.2022	25.07.2022 To 30.07.2022	25.07.2022 To 30.07.2022	01.10.2022 To 10.10.2022	01.10.2022 To 10.10.2022
Theory Examinations	01.08.2022 To 20.08.2022	01.08.2022 To 20.08.2022	01.08.2022 To 20.08.2022	01.08.2022 To 20.08.2022	01.08.2022 To 20.08.2022	01.08.2022 To 20.08.2022	12.09.2022 To 30.09.2022	12.09.2022 To 30.09.2022
Internship	21.08.2022 To 10.09.2022	---	21.08.2022 To 10.09.2022		---	---	11.10.2022 To 30.10.2022	
Commencement of ODD semester	12.09.2022	12.09.2022	12.09.2022	01.09.2022	12.09.2022	12.09.2022	31.10.2022	31.10.2022

Please Note:

- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by MHRD/UGC/AICTE/State Government.
- Academic Calendar is also applicable for **Autonomous Colleges.** In case any changes are to be effected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.

22/8/2022

REGISTRAR

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE, BENGALURU-560061.

DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES ACADEMIC CALENDAR 2021-22 (EVEN SEM)

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
DAY	DATE	EVENT	DATE	EVENT	DATE	EVENT	DATE	EVENT	DATE	EVENT	DATE	EVENT
THU											1	
FRI	1						1				2	
SAT	2	UGADHI					2				3	
SUN	3		1	LABOURS DAY			3				4	
MON	4	STARTING OF 5 & 6 SEM	2				4	THEORY EXAM 8 SEM - 4/7/22-20/7/22	1	THEORY EXAM 6 SEM - 1/8/22- 20/8/22	5	
TUE	5		3	BASAVA JAYANTHI/RAMZA			5		2		6	
WED	6		4		1		6	3 INTERNALS - 6 SEM	3		7	
THU	7		5		2		7		4		8	
FRI	8		6		3		8		5		9	
SAT	9	2ND SATURDAY	7		4		9	2ND SATURDAY	6		10	LWD 2ND SEM
SUN	10		8		5		10		7		11	
MON	11		9		6	2ND INTERNALS - 6 & 8 SEM INAUGURATION DAY - 2ND SEM	11	LAB INTERNALS 6 SEM ALUMNI	8		12	
TUE	12		10	1ST INTERNALS - 6 & 8 SEM	7		12		9	MOHARAM	13	
WED	13		11		8		13		10		14	
THU	14	AMBEDKAR/ MAHAVIR	12		9	ORIENTATION DAY - 2ND SEM	14		11		15	
FRI	15	GOOD FRIDAY	13		10		15		12		16	
SAT	16		14	2ND SATURDAY	11	2ND SATURDAY	16		13	2ND SATURDAY	17	2ND SATURDAY
SUN	17		15		12		17		14		18	
MON	18		16		13		18		15	INDEPENDENCE DAY	19	
TUE	19		17		14		19	PRACTICAL EXAM – 6 SEM - 18/7/22-29/7/22	16		20	
WED	20		18		15		20		17		21	
THU	21		19		16		21		18		22	
FRI	22		20		17		22	GRADUATION DAY	19		23	
SAT	23	4TH SATURDAY	21		18		23	4TH SATURDAY	20		24	4TH SATURDAY
SUN	24		22		19		24		21		25	
MON	25		23		20	CULTURAL DAY	25		22	COMMENCEMENT OF ODD	26	
TUE	26		24		21	SPORTS DAY	26		23		27	
WED	27		25		22	ETHNIC DAY	27		24		28	
THU	28		26		23	ANNUAL DAY	28		25		29	
FRI	29		27		24		29		26		30	
SAT	30	LWD - 1ST SEM	28	4TH SATURDAY	25	4TH SATURDAY	30		27	4TH SATURDAY	31	4TH SATURDAY
SUN			29		26		31	GOWRI GANESHA	28			
MON			30		27	3RD INTERNALS - 8 SEM			29			
TUE			31		28				30			
WED					29			ATTESTED COPY				
THU					30	LWD - 8 SEM						

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

CITY ENGINEERING COLLEGE

ACADEMIC YEAR: 2021-22

DEPARTMENT OF BASICSCIENCE

COURSE PREFERENCE

Name of the Faculty: Dr. Sujatha K

Designation: Professor and HOD

Sl. No	Course Code and Name	Year/Semester
1.	21PHY12 ENGINEERING PHYSICS FOR D SECTION	2021/II

Signature of Faculty

Department of Physics

HOD

Department of Physics

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

ACADEMIC YEAR: 2021-22

DEPARTMENT OF BASICSCIENCE

COURSE PREFERENCE

Name of the Faculty: Mrs. Nagasree G

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1.	21PHY12 ENGINEERING PHYSICS FOR C SECTION	2021/II

Signature of Faculty

Department of Physics

HOD

Department of Physics

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

CITY ENGINEERING COLLEGE
TIME TABLE –FIRST SEMESTER DECEMBER – 2021-22
PHYSICS CYCLE

SECTION: C **ROOM NO: 007**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON	MAT	PHY	BREAK	EVN	EVN	LUNCH	←---PHYL/EVNL/ELEL /C1/C2/C3---→		
TUE	PHY	MAT		CIV	ELE(T)		EGH	EGH	EGHLA2
WED	CIV	←---PHYL		EVNL/ELEL /C2/C3/C1→			ELE	MAT	EGHLA3
THU	CIV	ELE		PHY(T)	IDT		←--- PHYL/EVNL/ELEL /C3/C1/C2---→		
FRI	ELE	MAT		PHY	CIV		EDUSAT/DEP/COLLEGE ACVIVITIES/LIBARARY		
SAT	ELE	PHY		CIV (T)	EGHLA1				

MAT- Dr. JYOTHI.P & PROF. VANITHA.G
CIV - Prof.Manjunath
IDT - Ms. Shwethashree
EVN - Dr. Karunakara, Prof.Anil, Prof.Shruthi
ELEL - Prof. Mallikarjuna.G.S & Prof.Ravindra.S

ELE - Prof. Mallikarjuna.G.S
PHY - Dr.K.Sujatha & Prof. Nagashree G
EGH, EGHL - New Staff
PHYL-Dr.K.Sujatha & Prof. Nagashree G

PROCTORS - Prof. Nagashree.G & Prof. Vanitha.G

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

HOD **PRINCIPAL**

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

CITY ENGINEERING COLLEGE
TIME TABLE –FIRST SEMESTER DECEMBER – 2021-22
PHYSICS CYCLE

SECTION: D **ROOM NO:A006**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON	CIV	MAT	BREAK	PHY	IDT	LUNCH	ELE	EGH	EGH
TUE	ELE	PHY		EVN	EVN		←--PHYL/ EVNL/ELEL/D1/D2/D3--→		
WED	MAT	ELE		CIV	PHY		←--PHYL/ EVNL/ELEL/D2/D3/D1--→		
THU	MAT	←--PHYL/		EVNL/ELEL/D3/D1/D2-----→			EGHLB1	EGHLB2	EGHLB3
FRI	PHY	ELE(T)		CIV	MAT		EDUSAT/DEP/COLLEGE ACVIVITIES/LIBARARY		
SAT	CIV	ELE		PHY(T)	MAT(T)				

MAT Dr.Jyothi.& Prof. Gayathri.A
EVN-Prof.Shruthi & Prof.Anil
IDTMs. Shwethashree
EVNL Dr.Karunakara, Prof.Shruthi & Prof. Anil
ELEL G Dr.Shalini & Prof.Ravindra,S

ELE Dr. Shalini
PHY - Dr.K.Sujatha & Prof Nagashree.G
EGH,EGHL - New Staff
PHYL Dr.K.Sujatha & Prof Nagashree
CIV Prof.Manjunath

PROCTORS - Prof.Gayathri.A & Prof. Shruthi

HOD

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

PRINCIPAL

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

CITY ENGINEERING COLLEGE
TIME TABLE –FIRST SEMESTER DECEMBER – 2021-22
PHYSICS CYCLE

Dr. K. Sujatha **SUBJECT CODE: 21PHY12**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON			BREAK	D		LUNCH			
TUE		D					←----------PHYL/D1----------→		
WED					D		←----------PHYL/D2----------→		
THU		←PHYL/D3		PHYL/D3----------→					
FRI	D								
SAT				D(T)					

HOD

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

PRINCIPAL

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

CITY ENGINEERING COLLEGE
TIME TABLE –FIRST SEMESTER DECEMBER – 2021-22
PHYSICS CYCLE

Mrs. Nagashree. G **SUBJECT CODE: 21PHY12**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON		C	BREAK			LUNCH	←----------PHYL/C1----------→		
TUE	C								
WED		←PHYL/C2		PHYL/C2--------→					
THU				C(T)			←----------PHYL/C3----------→		
FRI				C					
SAT		C							

HOD

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

PRINCIPAL

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

I/II Semester

Engineering Physics			
Course Code	**21PHY12/22**	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	2:2:0:1	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03 Hours

Course objectives: This course(21PHY12/22) will enable the students to

- Learn the basic concepts of Physics which are essential in understanding and solving Engineering related challenges.
- Gain the knowledge of problem solving and its practical applications.
- Signify the application of sensitive instrumentation for Nano-scale system.

Teaching-Learning Process (General Instructions)

These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes.

1. Apart from conventional lecture methods various types of innovative teaching techniques through videos, animation films may be adopted so that the delivered lesson can progress the students in theoretical, applied and practical skills in physics.
2. State the necessity of physics in engineering studies and offer real life examples.
3. Seminars and Quizzes may be arranged for students in respective subjects to develop skills.
4. Encourage the students for group learning to improve their creativity and analytical skills.
5. While teaching show how every concepts can be applied to the real world. This helps the students to expand understanding level.
6. Support and guide the students for self-study.
7. Ask some higher order thinking questions in the class, which promotes critical thinking.
8. Inspire the students towards the studies by giving new ideas and examples.

Module-1

Oscillations and Waves: **08 Hours**

Free Oscillations: Basics of SHM, derivation of differential equation for SHM, Mechanical simple harmonic oscillators (spring constant by series and parallel combination), Equation of motion for free oscillations, Natural frequency of oscillations.

Damped Oscillations: Theory of damped oscillations (derivation), over damping, critical & under damping (only graphical representation), quality factor.

ForcedOscillations: Theory of forced oscillations (derivation) and resonance, sharpness of resonance.

Shock waves: Mach number, Properties of Shock waves, Construction and working of Reddy shock tube, applications of shock waves, Numerical problems.

Teaching-Learning Process	Chalk and talk, Power point presentation, Videos **Practical Topics**: 1.Spring in series and parallel combination **Self-study Component:** Basics of SHM

Module-2

Modern Physics & Quantum Mechanics: **08 Hours**

Introduction to blackbody radiation spectrum- Wien's law, Rayleigh Jean's law, Stefan -Boltzmann law and Planck's law (qualitative), Deduction of Wien's law and Rayleigh Jeans law from Planck's law. Wave-Particle dualism, de-Broglie hypothesis, de-Broglie wavelength. Heisenberg's uncertainty principle and its physical significance, Application of uncertainty principle-Non-existence of electron in the nucleus (relativistic case), Wave function- Properties, Physical significance, Probability density, Normalization, Eigen values and Eigen functions. Time independent Schrödinger wave equation. Particle in a box- Energy Eigen values and probability densities, Numerical problems.

Teaching-Learning Process	Chalk and talk, Power point presentation, Videos **Practical Topics:** 1.Verification of Stefan's Law **Self-study Component:** Wave- Particle dualism, de-Broglie hypothesis , de- Broglie wavelength.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

Module-3

Lasers & Optical Fibers: **08 Hours**

Lasers: Interaction of radiation with matter, Einstein's coefficients (derivation of expression for energy density). Requisites of a Laser system. Conditions for Laser action. Principle, Construction and working of CO_2 and semiconductor Lasers. Application of Lasers in Defence (Laser range finder) and medical applications- Eye surgery and skin treatment.

Optical Fibers: Propagation mechanism, angle of acceptance, Numerical aperture, Modes of propagation, Types of optical fibers, Attenuation and Mention of expression for attenuation coefficient. Discussion of block diagram of point to point communication, Optical fiber sensors- Intensity based displacement sensor and Temperature sensor based

Teaching-Learning Process	Chalk and talk, Power point presentation, Videos **Practical Topics:** 1. wavelength of LASER source 2. Optical fiber **Self-study Component:** Properties of Laser and comparison with ordinary source

Module-4

Electrical Conductivity in Solids: **08 Hours**

Classical free electron theory: Drude- Lorentz theory & Assumptions, Expression for electrical conductivity (no derivation), Failures of classical free-electron theory.

Quantum free electron theory: Assumptions, Density of states (no derivation), Fermi-energy, Fermi factor & its temperature dependence, Fermi - Dirac Statistics, Expression for electrical conductivity (derivation), Merits of Quantum free electron theory.

Physics of Semiconductors: Fermi level in intrinsic semiconductors, Expression for concentration of electrons in conduction band, Holes concentration in valance band (only mention the expression), Conductivity of semiconductors (derivation), Hall effect, Expression for Hall coefficient (derivation).

Dielectrics: Electric dipole, Dipole moment, Polarization of dielectric materials, Types of polarizations. Qualitative treatment of Internal field in solids for one dimensional infinite array of dipoles (Lorentz field). Claussius-Mossotti equation (derivation), Numerical problems.

Teaching-Learning Process	Chalk and talk, Power point presentation, Videos **Practical Topics:** 1.Fermi Energy of a material 2. Resistivity of a material **Self-study Component:** Electric dipole, Dipole moment, Polarization of dielectric materials

Module-5

Material Characterization Techniques and Instrumentation: **08 Hours**

Introduction to materials: Nanomaterials and nanocomposites. Principle, construction and working of X-ray Diffractometer, crystal size determination by Scherrer equation. Principle, construction, working and applications of -Atomic Force Microscope (AFM), X-ray Photoelectron *S*pectroscope (XPS), Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM) Numerical problems.

Teaching-Learning Process	Chalk and talk, Power point presentation, Videos **Self study Component:**X-ray diffractometer.

Course outcome (Course Skill Set)

At the end of the course the student will be able to :

1. Interpret the types of mechanical vibrations and their applications, the role of Shock waves in various fields.
2. Demonstrate the quantisation of energy for microscopic system.
3. App[y LASER and Optical fibers in opto electronic system.
4. Illustrate merits of quantum free electron theory and applications of Hall effect.
5. Analyse the importance of XRD and Electron Microscopy in Nano material characterization.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50)in the semester-end examination(SEE).

Continuous Internal Evaluation:

Three Unit Tests each of **20 Marks (duration 01 hour**)

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 15th week of the semester

Two assignments each of **10 Marks**

4. First assignment at the end of 4th week of the semester
5. Second assignment at the end of 9th week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks** (**duration 01 hours**)

6. At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours)**

1. The question paper will have ten questions. Each question is set for 20 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

The students have to answer 5 full questions, selecting one full question from each module.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Suggested Learning Resources:

Text Books:

1. A Text book of Engineering Physics- M.N. Avadhanulu and P.G. Kshirsagar, 10th revised Ed, S. Chand. & Company Ltd, New Delhi.
2. An Introduction to Lasers theory and applications by M.N.Avadhanulu and P.S.Hemne revised Edition 2012 . S. Chand and company Ltd -New Delhi.
3. Engineering Physics-Gaur and Gupta-Dhanpat Rai Publications-2017.
4. Concepts of Modern Physics-Arthur Beiser: 6th Ed;Tata McGraw Hill Edu Pvt Ltd- New Delhi 2006.
5. X-ray diffraction- B E Warren published by Courier Corporation.
6. Nano Composite Materials-Synthesis, Properties and Applications, J. Parameswaranpillai,, N.Hameed, T.Kurian, Y. Yu, CRC Press.
7. Fundamentals of Fibre Optics in Telecommunication & Sensor Systems, B.P. Pal, New Age International Publishers.

Reference Books:

1. Introduction to Mechanics — M.K. Verma: 2nd Ed, University Press(India) Pvt Ltd, Hyderabad 2009.
2. Lasers and Non Linear Optics – B.B. Laud, 3rd Ed, New Age International Publishers 2011.
3. LASERS Principles, Types and Applications by K.R. Nambiar-New Age International Publishers.
4. Solid State Physics-S O Pillai, 8th Ed- New Age International Publishers-2018.
5. Shock waves made simple- Chintoo S Kumar, K Takayama and KPJ Reddy: Willey India Pvt. Ltd. New Delhi2014.
6. Materials Characterization Techniques-Sam Zhang, Lin Li, Ashok Kumar, CRC Press, First Edition, 2008.
7. Characterization of Materials- Mitra P.K . Prentice Hall India Learning Private Limited.
8. Nanoscience and Nanotechnology: Fundamentals to Frontiers – M.S.Ramachandra Rao & Shubra Singh, Wiley India Pvt Ltd .

Web links and Video Lectures (e-Resources):

https://www.britannica.com/technology/laser,k
https://nptel.ac.in/courses/115/102/115102124/
https://nptel.ac.in/courses/115/104/115104096/
http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html
https://onlinecourses.nptel.ac.in/noc20_mm14/preview

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

http://nptel.ac.in
https://swayam.gov.in
https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF PHYSICS

LESSON PLAN FOR ODD SEMESTER FOR ACADEMIC YEAR 2021 - 22

Course Title: **Engineering Physics**	Course Code : 21PHY12/22
Total contact hours: L:T:P:S :: 2:2:0:1	End Term Marks : 100
CIE Marks : 50 SEE Marks :50	
Semester : I	Academic year : 2021-22
Lesson plan Author: Dr K Sujatha and Nagashree G	Date :01/05/2022

Course Objective:

.Understand the concept of SHM,shock waves and their applications.

.Understand the basic concepts in quantum mechanics and its applications to diverse areas like lasers,optical fibers and electrical properties of solids.

.Gain the knowledge of newer concepts in physics for the better appreciation of instrumentation technology.

Course Outcomes:

After studying this course, students will be able to:

1.Understand various types of oscillations and their implications,the role of Shock waves in various fields.

2.Compute Eigen values,Eigen functions,momentum of atomic and subatomic particles using time independent 1-D Scrodinger's wave equation.

3.Apprehend the basics of laser and optical fiber with different types and their applications in various fields.

4.Understand electricsl conductivity phenomenon in solid materials.

5.Understand the various measurement techniques.

MODULE-1

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
1	1	Oscillations and waves: Free oscillation:Basics of SHM,derivation of equation of SHM,Mechanical si,ple harmonic oscillator,	R,U	CO1
	2	equation of motion for free oscillation ,natural frequency of oscillation	R,U	CO1
	3	Damped oscillations: Theory of damped oscillations,over damping,critical and under damping,	R,U	CO1
	4	quality factor	R,U,E,C	CO1
2	1	Forced oscillations intoduction	R,U	CO1
	2	Theory of forced oscillations,derivation	R,U	CO1
	3	Resonance	R,U	CO1
	4	Sharpness of resonance	R,U	CO1
3	1	Shock waves: Mach number	R,U	CO1
	2	,properties of shock waves,	R,U	CO1
	3	construction and working of reddy shock tube,	R,U	CO1
	4	applications of shock waves,numerical problems.	R,U	CO1

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

MODULE-2

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
4	1	Introduction to blackbody radiation spectrum	R,U	CO2
	2	Wein's law ,Rayleigh jeans law and planck's law	R,U	CO2
	3	Deduction of Wein's law ,Rayleigh jeans law from planck's law	R,U	CO2
	4	Wave particle dualism,	R,U	CO2
5	1	de Broglie hypothesis, de Broglie wavelength	R,U	CO2
	2	Heisenberg's uncertainity principle and its physical significance	R,U	CO2
	3	Applications of uncertainity principle	R,U	CO2
	4	Wave function, properties,physical significance	R,U	CO2
6	1	Probability density,normalization	R,U	CO3
	2	Eigen values and Eigen functions	R,U	CO3
	3	Time independent scrodinger wave equation	R,U	CO3
	4	Particle in abox,Eigenenergy values and probability densities	R,U	CO3
	5	Numerical problems	R,U	CO3

MODULE-3

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
7	1	Lasers:Interaction of radiation and matter	R,U	CO4
	2	Einsteins coefficients(expression for energy density derivation)	R,U	CO4
	3	Requisites of a laser system	R,U,E	CO4
	4	Condition for laser action	R,U	CO4
8	1	Principle construction and working of carbondioxide laser	R,U	CO4
	2	Construction and working of semiconductor laser	R,U	CO4
	3	Applications of laser in defence	R,U	CO4
	4	Medical applications:eye surgery and skin treatment	R,U	CO4
	1	Optical fibers: Propagation mechanism,angle of acceptance,numerical aperture	R,U,C	CO4
9	2	Modes of propagation,types of optical fibers	R,U, A1	CO4
	3	Attenuation and its expression	R,U	CO4
	4	Discussion of Point to point communication system,applications	R,U	CO4
	5	Merits and demerits,numericals	R,U	CO4

MODULE-4

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
10	1	Electrical conductivity in solids: Classical free electron theory-Free eletron concept, Drude Lorentz theory and assumptions	R,U,	CO5
	2	Drift velocity,mean free path,mean collision time	R,U	CO5
	3	Expression for electrical conductivity,failures of classical free theory	R,U	CO5
	4	Quatum free electron theory:Assumptions,density of states,Fermi energy,Fermi factor	R,U	CO5
11	1	Fermi-dirac statistics,expression for electrical conductivity	R,U	CO5
	2	Merits of quantum free electron theory	R,U	CO5
	3	Physics of semiconductors:Fermi level in intrinsic semiconductors	R,U	CO5

MODULE-5

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
12	1	Introduction	R,U,A2	CO6
	2	boiler troubles scale & sludge formation	R,U	CO6
	3	Priming & foaming boiler corrosion	R,U	CO6
	4	Determination of DO, BOD	R,U	CO6
13	1	COD numerical problems	R,U,E	CO6
	2	Sewage treatment, primary method	R,U	CO6
	3	secondary and tertiary method	R,U	CO6
	4	softening of water by ion exchange method	R,U	CO6
14	1	Desalination of sea water by reverse osmosis & electrodialysis	R,U	CO6
	2	Introduction, properties Synthesis bottom up approach	R,U,A1,C	CO7
	3	sol-gel precipitation	R,U	CO7
	4	gas condensation	R,U	CO7
15	1	Nano materials – Nano clusters	R,U	CO7
	2	carbon Nano tubes	R,U	CO7
	3	Nano composites, fullerenes	R,U	CO7
	4	Nano wires, Nano rods, dendrimes	R,U,A1,C	CO7

Bloom's Taxonomy Level

R-Remembering U-Understanding A1-Applying A2-Analysing E-Evaluating C-Creating

Text Books:

1. B.S. Jai Prakash, R. Venugopal, Sivakumaraiah&pushpaIyengar, "Chemistry for Engineering Students" , Subhash publications, Bangalore
2. R.V. Gadag& A. NityanandaShetty "Engineering Chemistry"I.KInternationsl publishing House private Ltd. New Delhi.
3. P.C. Jain & Monica Jain, "Engineering Chemistry" DhanpatRai publications, New Delhi.

Reference Books:

1. O.G. Palanna, "Engineering Chemistry", Tata McGraw Hill Education Pvt. Ltd. New Delhi, Fourth Reprint.
2. G.A. Ozin & A.C. Arsenault, "Nano Chemistry A Chemical Approach to Nano materials" RSC publishing,2005
3. "Wiley Engineering Chemistry", Wiley India Pvt. Ltd. New Delhi. Second edition
4. V.R. Gowariker, N.V.Vishwanath&J.Sreedhar, "Polymer Science", Wiley Eastern Ltd.

List of URLs-Text Books, Notes, Multimedia Content, etc

- www.bookspar.com/engineering-vtu-note
- https//www.smartzworld.com/notes/engineering-chemisry
- www.LearnEngg.com
- www.kprblogin/cse/sem1/engineering-chemistry-video-lectures

www.nptel.ac.in

Signature of Staff **Signature of HOD**

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

Question Bank

Course Name: Engineering Physics **Course Code: 21PHYS12**

Semester: I **Section: A, B**

MODULE I

Oscillation and Waves:

1. Define Simple Harmonic Motion. Derive the equation of motion foe SHM.
2. Derive the expression for force constants for series and parallel combination of spring.
3. Explain how Complex notation Phasor representation is represented.
4. Define free oscillations with example. Mention the equation of motion of natural frequency of vibration.
5. What are Damped oscillations. Give the theory. Discuss the case of under damping, over damping and critical damping.
6.Define Quality factor with equation. Give its Physical significance.
7. What are Forced Oscillations Derive the expressions for amplitude and Phase of Forced vibrations. Explain all the three cases.
8. Write a short note on a) Sharpness of Resonance b) Helmoltz Resonator

Shock waves

1. Define Mach Number and Mach angle
2.Distinguish between Acoustic, Ultrasonic, subsonic, supersonic, transonic and hypersonic waves.
3. What are shock waves and mention the properties of shock waves.
4. Explain Control Volume
5.State and explain the law of conservation of mass, momentum and energy with expressions.
6.Describe the construction and working of Reddy Shock tube experiment.
7. What are the applications of Shock waves

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

MODULE II

MODERN PHYSICS

1.Explain energy distribution in the spectrum of blackbody.
2.What is blackbody . Discuss Wein's law and its limitations.
3.State and explain Rayleigh jean's law. Explain ultraviolet catastrophe.
4.State Planck's law of radiation and deduce wein's law and Rayleigh jean's law.
5.Explain Compton effect and give its physical significance?

6. What is de Broglie concept of matter waves? Show that de Broglie wavelength for an electron accelerated by a potential difference $\lambda=1.226/\sqrt{v}$ nm

7.Define group velocity and phase velocity . Derive the relation between them.
8.Derive the relation between group velocity and particle velocity.
9. What are the characteristics of matter waves?

QUANTUM MECHANICS

1.Explain Heisenberg's uncertainty principle. Give its physical significance?
2.Show that a free electron cannot exist within the nucleus of an atom using Heisenberg's uncertainty principle.
3.Set up time-independent one-dimension Schrodinger wave equation.
4.Explain the physical significance and normalization of a wave function.
5. What is a wave function and What are its properties?
6.Solve the Schrodinger wave equation for the allowed energy values in the case of particle in a box?
7.Discuss the wave functions ,probability densities and energy levels for particle in an infinite potential well.
8.Explain energy Eigen values for a free particle?

MODULE III

LASERS

1.Discuss the three possible ways through which radiation and matter interaction can take place with neat sketches.
2a).What are the requirements of a laser system.
b)Discuss the condition required for laser action.
3.Obtain an expression for energy density of radiation in terms of Einstein coefficient under equilibrium condition.
4.Describe the construction and working ofco_2 laser with the help of energy level diagram.
5.Explain the construction and working of semiconductor laser.

6.Describe briefly the application of lasers in welding, cutting, and drilling.
7.Describe the construction and reconstruction processes in holography with the help of suitable diagram and some applications.

8.Explain how to measure of pollutants in the atmosphere with the help of a diagram.

OPTICAL FIBRES

1.Explain the construction & working principle of optical fibres.
2.Explain how an optical fibre functions as a wave guide.
3.What is numerical aperture? Obtain an expression for numerical aperture in terms of refractive indices of core & cladding & then arrive at the condition for propagation.

4.Discuss the different types of optical fibres with suitable diagrams.
5.What is attenuation in an optical fibre ? Explain the different mechanism of attenuation.

6.Describe point to point communication system using optical fibres with the help of a block diagram and mention its advantages & disadvantages.

MODULE IV

ELECTRICAL CONDUCTIVITY IN SOLIDS:

1. What are the assumptions of classical free electron theory and the failures of classical free electron theory .
2.What are the assumptions of Quantum free electron theory.
3.Define density of states and mention the expression for density of states.
4.Explain Fermi level, Fermi energy, Fermi-Dirac statistics.
5.Define Fermi Factor. Discuss the variation of Fermi Factor on different conditions of temperature and energy.
6.Derive the expression for Fermi energy at zero Kelvin. Mention the expression for Fermi velocity and Fermi temperature.
7. Discuss the success of Quantum free electron theory.
8.Discuss the Fermi level in intrinsic semiconductor. Mention the expression for electron and hole concentration in intrinsic semiconductor.
9.Derive the relation between Fermi energy and energy gap for an intrinsic semiconductor.
10.Derive the expression for electrical conductivity of semiconductors.
11.What is Hall Effect? Obtain the expression for Hall voltage in terms of Hall coefficient.
12.What are dielectric materials .Explain the types of dielectric materials. Discuss solid, liquid and gaseous dielectric with one example each.
13.Explain polarization and the types of polarization. Mention the relation between dielectric constant and polarization.
14.Define internal field in case of solids and mention its expression for one dimensional case, three dimensional caseand Lorentz field.
15.Derive Clausius-Mossotti equation.
16.Mention the application of dielectric in transformers.

CITY ENGINEERING COLLEGE

MODULE V

Nano Materials

1.What are Nano materials? Discuss about mesoscopic state?
2.Explain density of states in various quantum structures?
3.Explain Top-down & Bottom-up approach?
4.Explain Ball milling method with the help of suitable diagrams?
5.Describe Sol-Gel method of producing Nano Materials?
6.Write a note on Carbon Nano tubes?
7. Describe arc discharge method of obtaining CNTs with the help of a diagram.
8. Write a note on Pyrolysis method of obtaining CNT
9. Describe the principle, construction and working of a scanning electron microscope?

Staff

Mrs. Nagasree G
Department of Physics

HOD

Dr. Sujatha
Department of Physics

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

Assignment Questions

Even Semester 21-22

Course Name: Engineering Physics **Course Code: 21PHYS22**

Semester: II **Section: C, D**

MODULE I

Oscillation and Waves:

1. Define Simple Harmonic Motion. Derive the equation of motion foe SHM.
2. Derive the expression for force constants for series and parallel combination of spring.
3. Explain how Complex notation Phasor representation is represented.
4. Define free oscillations with example. Mention the equation of motion of natural frequency of vibration.
5. What are Damped oscillations. Give the theory. Discuss the case of under damping, over damping and critical damping.
6.Define Quality factor with equation. Give its Physical significance.
7. What are Forced Oscillations Derive the expressions for amplitude and Phase of Forced vibrations. Explain all the three cases.
8. Write a short note on a) Sharpness of Resonance b) Helmoltz Resonator

Shock waves

1. Define Mach Number and Mach angle
2.Distinguish between Acoustic, Ultrasonic, subsonic, supersonic, transonic and hypersonic waves.
3. What are shock waves and mention the properties of shock waves.
4. Explain Control Volume
5.State and explain the law of conservation of mass, momentum and energy with expressions.
6.Describe the construction and working of Reddy Shock tube experiment.
7. What are the applications of Shock waves

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

MODULE II

MODERN PHYSICS

1.Explain energy distribution in the spectrum of blackbody.
2.What is blackbody. Discuss Wein's law and its limitations.
3.State and explain Rayleigh jean's law. Explain ultraviolet catastrophe.
4.State Planck's law of radiation and deduce wein's law and Rayleigh jean's law.
5.Explain Compton effect and give its physical significance?
6. What is de Broglie concept of matter waves? Show that de Broglie wavelength for an electron accelerated by a potential difference $\lambda=1.226/\sqrt{v}$ nm

7.Define group velocity and phase velocity . Derive the relation between them.
8.Derive the relation between group velocity and particle velocity.
9. What are the characteristics of matter waves?

QUANTUM MECHANICS

1.Explain Heisenberg's uncertainty principle. Give its physical significance?
2.Show that a free electron cannot exist within the nucleus of an atom using Heisenberg's uncertainty principle.
3.Set up time-independent one-dimension Schrodinger wave equation.
4.Explain the physical significance and normalization of a wave function.
5. What is a wave function and What are its properties?
6.Solve the Schrodinger wave equation for the allowed energy values in the case of particle in a box?
7.Discuss the wave functions ,probability densities and energy levels for particle in an infinite potential well.
8.Explain energy Eigen values for a free particle?

MODULE III

LASERS

1.Discuss the three possible ways through which radiation and matter interaction can take place with neat sketches.
2a).What are the requirements of a laser system.
b)Discuss the condition required for laser action.
3.Obtain an expression for energy density of radiation in terms of Einstein coefficient under equilibrium condition.
4.Describe the construction and working ofco_2 laser with the help of energy level diagram.
5.Explain the construction and working of semiconductor laser.

6.Describe briefly the application of lasers in welding, cutting, and drilling.
7.Describe the construction and reconstruction processes in holography with the help of suitable diagram and some applications.

8.Explain how to measure of pollutants in the atmosphere with the help of a diagram.

OPTICAL FIBRES

1.Explain the construction & working principle of optical fibres.
2.Explain how an optical fibre functions as a wave guide.
3.What is numerical aperture? Obtain an expression for numerical aperture in terms of refractive indices of core & cladding & then arrive at the condition for propagation.

4.Discuss the different types of optical fibres with suitable diagrams.
5.What is attenuation in an optical fibre ? Explain the different mechanism of attenuation.

6.Describe point to point communication system using optical fibres with the help of a block diagram and mention its advantages & disadvantages.

MODULE IV

ELECTRICAL CONDUCTIVITY IN SOLIDS:

1. What are the assumptions of classical free electron theory and the failures of classical free electron theory .
2.What are the assumptions of Quantum free electron theory.
3.Define density of states and mention the expression for density of states.
4.Explain Fermi level, Fermi energy, Fermi-Dirac statistics.
5.Define Fermi Factor. Discuss the variation of Fermi Factor on different conditions of temperature and energy.
6.Derive the expression for Fermi energy at zero Kelvin. Mention the expression for Fermi velocity and Fermi temperature.
7. Discuss the success of Quantum free electron theory.
8.Discuss the Fermi level in intrinsic semiconductor. Mention the expression for electron and hole concentration in intrinsic semiconductor.
9.Derive the relation between Fermi energy and energy gap for an intrinsic semiconductor.
10.Derive the expression for electrical conductivity of semiconductors.
11.What is Hall Effect? Obtain the expression for Hall voltage in terms of Hall coefficient.
12.What are dielectric materials .Explain the types of dielectric materials. Discuss solid, liquid and gaseous dielectric with one example each.
13.Explain polarization and the types of polarization. Mention the relation between dielectric constant and polarization.
14.Define internal field in case of solids and mention its expression for one dimensional case, three dimensional caseand Lorentz field.
15.Derive Clausius-Mossotti equation.
16.Mention the application of dielectric in transformers.

CITY ENGINEERING COLLEGE

MODULE V

Nano Materials

1.What are Nano materials? Discuss about mesoscopic state?
2.Explain density of states in various quantum structures?
3.Explain Top-down & Bottom-up approach?
4.Explain Ball milling method with the help of suitable diagrams?
5.Describe Sol-Gel method of producing Nano Materials?
6.Write a note on Carbon Nano tubes?
7. Describe arc discharge method of obtaining CNTs with the help of a diagram.
8. Write a note on Pyrolysis method of obtaining CNT
9. Describe the principle, construction and working of a scanning electron microscope?

Staff

Mrs. Nagasree G
Department of Physics

HOD

Dr. Sujatha
Department of Physics

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN | 1 | C | E | | | | | | | |

CITY ENGINEERING COLLEGE

I Internal Test

Sem & Branch:2nd /All branches
Sub Name: Engineering Physics,21PHY22
Max Marks: 40

Date:05/07/2022
Time:10:30-12:00
Duration: 1:30 hr.

Note: Answer all Questions selecting any ONE FULL questions from each part

Q No.	Questions	Marks	CO's	BT Level
	PART-A			
1	Obtain an expression for energy density of radiation under equilibrium condition in terms of Einstein's coefficients.	10	CO3	BT2
	OR			
2.a	Define SHM . Mention their characteristics and applications.	6	CO1	BT1
b	A mass 0.5 kg causes an extension 0.03 m in a spring and the system is set for oscillations. Find (i) force constant K of the spring (ii) angular frequency ω and (iii) period T of the resulting oscillation	4	CO1	BT5
	PART-B			
3	What are damped oscillations? Obtain the general solution for damped vibrations by determining the constants.	10	CO3	BT2
	OR			
4.a	Describe how a laser range finder is made use of in defense.	6	CO3	BT2
b	The ratio of population of two energy levels is 1.059×10^{-30}. Find the wavelength of light emitted by spontaneous emission by 330 k.	4	CO3	BT5
	PART-C			
5	Describe the construction and working of CO_2 laser with suitable diagrams.	10	CO3	BT2
	OR			
6	What are free oscillations. Derive the expression for the same mentioning the expression for frequency and time period.	10	CO1	BT2
	PART-D			
7.a	Derive the expressions for force constants for series and parallel combination of springs.	6	CO3	BT3

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

b	A free particle is executing simple harmonic motion in a straight line. The maximum velocity it attains during oscillation is 62.8 m/s . Find the frequency of oscillation, if its amplitude is 0.5 m.	4	CO3	BT5
	OR			
8.a	Discuss the condition for laser action.	6	CO1	BT1
b	A pulsed laser emits photons of wavelength 780 nm with 20 mW average power /pulse. Calculate the number of photons contained in each pulse if the pulse duration is 10 ns.	4	CO1	BT5

Course Outcomes:

CO1: Understand various types of oscillations and their implications, the role of shock waves in various fields.

CO3: Apprehend the basics of laser and optical fiber with different types and their applications in various fields.

Blooms Taxonomy:

BT1-Knowledge BT2-Understand BT3-Apply BT4-Creating BT5-Evaluate

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF Phycics

SCHEME FOR VALUATION

Internal Test I

Semester & Section: IInd / C,D Date: 05/07/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
	Part-A		
(1)	Explanation of three cases	3M	
	arrive up to $v_d = \frac{A_{21}}{B_{21}\left(\frac{B_{12}}{B_{21}} e^{h\nu/kT} - 1\right)}$	4M	10M
	arrive up to $v_d = \frac{A}{B\left(e^{h\nu/kT} - 1\right)}$	4M	
	(a)		
(2) a)	Definition of SHM	2M	
	Characteristics and applications of S.H.M	2M 2M	6M
(b)	Given $x = -0.03$ m $m = 0.5$ kg		
	To find K, ω & T		
	W.K.T $F = mg = 0.5 \times 9.8$ N	1M	
	$F_x = -4.9$ N	1M	
	$K = \frac{-F_x}{x} = 163.3$ N/m	1M	4M
	$\omega = \sqrt{K/m} = 18.1$ rad/s	1M	
	$f = \omega/2\pi = 2.87$ Hz, $T = \frac{1}{f} = 0.355$	1M	

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test I

Semester & Section: IIud / C,D

Date: 05/07/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
	Part-B		
(3)	Damped Oscillations explanation with examples	2M	
	arrive upto $\frac{d^2x}{dt^2} + 2b\frac{dx}{dt} + \omega^2 x = 0$	4M	10M
	arrive Constants C and D	4M	
	(OR)		
(4) a)	Explanation of laser range finder operation and principle with diagram	2M 3M 1M	6M
b)	Data: $N_2/N_1 = 1.059 \times 10^{-30}$		
	$T = 330\ K$		
	$\lambda = ?$		
	W.K.T $\frac{N_2}{N_1} = e^{-hc/\lambda KT}$	1M	
	$\ln\left(\frac{N_2}{N_1}\right) = \left(\frac{-hc}{\lambda KT}\right)$	2M	4M
	$\lambda = \frac{-hc}{KT \ln\left(\frac{N_2}{N_1}\right)} = 632\ nm$	1M	

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test ... I ...

Semester & Section: IInd / C, D Date: 05/07/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
	Part-C		
(5)	Construction and working of CO_2 laser with suitable diagrams and equations	3M+3M 2M+2M	10M
	(OR)		
(6)	Free Oscillations explanation	2M	
	arrive upto $\frac{d^2x}{dt^2} + \frac{k}{m}x = 0$	6M	10M
	and $T = \frac{1}{2\pi}\sqrt{\frac{m}{k}}$ s, $\nu = 2\pi\sqrt{\frac{k}{m}}$ Hz	2M	
	Part-D		
(7) (a)	Diagrams and explanation	2M	
	arrive upto $K_S = \frac{K_1 K_2}{K_1 + K_2}$		
	$\therefore \frac{1}{K_S} = \sum_{i=1}^{n} \frac{1}{k_i}$	2M	6M
	arrive upto $K_p = K_1 + K_2$	2M	
	$\therefore K_p = K_1 + K_2 + \ldots\ldots + K_n$		

Staff HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test I

Semester & Section: IInd / C, D Date: 05/07/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
(b)	Data $V_{max} = 62.8$ m/s, $a = 0.5$ m		
	d = ?		
	W.K.T $x = a\sin\omega t$		
	$v = \frac{dx}{dt} = a\omega\cos\omega t$		
	$\omega = \frac{V_{max}}{a} = 125.6$ rad/s		
	$\nu = \frac{\omega}{2\pi} = 20$ Hz		
	(OR)		
(8)(a)	Diagram and explanation	2+4	6M
(b)	Data - $\lambda = 780$ nm, N = ?		
	$P = 20$ mW		
	$t = 10$ ns		
	W.K.T $\Delta E = \frac{hc}{\lambda} = 2.55\times10^{-19}$ J	1M	
	$\therefore E = P\times t = 2\times10^{-10}$ J	2M	4M
	$\therefore N\,\&\,\Delta E = E$		
	$N = \frac{E}{\Delta E} = 7.86\times10^{8}$	1M	

Staff HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN | 1 | C | E | | | | | | | |

SUB CODE:21PHY22

CITY ENGINEERING COLLEGE

IInd Internal Test

Sem & Branch: 2nd/All Branches
Subject Name:Engineering Physics
Max Marks: 40 Duration: 1:30 hr.

Date: 04/08/2022
Time: 10:30-12:00

Note: Answer all Questions selecting any ONE FULL questions from each part

Q No.	Sub Q No.	Questions	Marks	CO's	BT Level
		PART-A			
1		Define Numerical aperture and acceptance angle. With a neat diagram derive an expression for Numerical aperture in an optical fiber.	10	CO3	BT2
		OR			
2	a	What are shock waves? Mention the properties and applications of shock waves.	6	CO1	BT1
	b	The distance between the two sensors in a shock tube is 150 mm. The time taken by a shock wave to travel this distance is 0.3 ms. If the velocity of a sound under the same condition is 340 m/s. Find the Mach number of the shock wave.	4	CO1	BT5
		PART-B			
3		Describe the construction and working of Reddy Shock tube.	10	CO1	BT4
		OR			
4		What are Forced oscillations? Derive the condition for amplitude and phase.	10	CO1	BT4
		Part -C			
5	a	What is attenuation? Explain the different mechanisms through which attenuation takes place and mention attenuation coefficient.	7	CO3	BT2
	b	Find the attenuation in an optical fiber of length 500 m, when a light signal of power 100 mW emerges out of the fiber with a power 90mW.	3	CO3	BT5
		OR			
6	a	Explain point to point communication system in an optical fiber with a suitable diagram.	6	CO3	BT2
	b	Distinguish between acoustic, ultrasonic, subsonic and supersonic waves	4	CO1	BT1

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PART-D

7	a	Discuss the different types of optical fibers with suitable diagrams.	07	CO3	BT2
	b	The refractive indices of core and cladding are 1.50 and 1.48 respectively in an optical fiber. Find the numerical aperture and angle of acceptance.	03	CO3	BT5
		OR			
8		Explain in detail temperature/pressure sensor and displacement sensor with suitable diagrams.	10	CO3	BT2

Course outcomes:

Co1: Understand various types of oscillations and their implications, the role of shock waves in various fields.

Co2: Compute Eigen values,Eigen functions,the momentum of atomic and subatomic particles using time independent Schrodinger 's wave equation.

Co3: Apprehend the basics of laser and optical fiber with different types and applications in various fields.

Co4: Understand electrical conductivity phenomena in solid materials.

Co5: Understand the various measurement techniques.

BT Levels:

BT1-Knowledge, BT2-Understand, BT3- Apply, BT4-Analyzing , BT5-Evaluate, BT6- Creating

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test II

Semester & Section: IInd / C, D

Date: 04/08/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
	Part - A		
(1)	Numerical aperture, acceptance angle def, diagram and explanation	2M	
	acive upto $\sin\theta$ ∠N.A	4M	10M
	and $N.A = \sqrt{n_1^2 - n_2^2}$	4M	
	(OR)		
(2)	(a) Shock waves explanation	2M	
	properties & applications of shock waves	2M 2M	6M
	(b) Given $l = 150$ mm		
	$t = 0.3$ ms	1M	
	$a = 340$ m/s		4M
	$M = ?$		
	$M = \frac{u}{a} = 1.47$, $u = \frac{d}{t} = 500$ m/s	3M	
	Part - B		
(3)	Diagram, Construction and working of Reddy shock tube	2+4+4	10M

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION_

Internal Test II

Semester & Section: IInd / E,D

Date: 04/08/22

Question No.	Details of the answer	Marks Distribution	Total Marks
4	(a) Forced oscillations explanation	2M	
	arrive upto $a = \frac{(F/m)}{\sqrt{4b^2p^2 + (\omega^2 - p^2)^2}}$	4M	10M
	and $\alpha = \tan^{-1}\left(\frac{2bp}{\omega^2 - p^2}\right)$	4M	
	page-C		
5 (a)	Attenuation def and coefficient	2M	
	Explanation of three different	2M	7M
	mechanics with suitable graph	3M	
(b)	Data - $L = 500\ m = 0.5\ km$		
	$P_{in} = 100\ mW = 100 \times 10^{-3}\ W$	1M	
	$P_{out} = 90\ mW = 90 \times 10^{-3}\ W$		3M
	$\alpha = ?$	1M	
	$\alpha = -\frac{10}{L}\log_{10}\left(\frac{P_{out}}{P_{in}}\right)$ dB/km		
	$= 0.915$ dB/km	1M	
6 (a)	(a) diagram and explanation of	2M +	
	point to point communication system	2M + 2M	6M

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test II

Semester & Section: IInd / C, D

Date: 04/08/22

Question No.	Details of the answer	Marks Distribution	Total Marks
6 (b)	Explanation of all waves acoustic, ultrasonic, subsonic and supersonic waves	4M	4M
	Part-D		
7 (a)	Explanation of three types of optical fibers with suitable diagrams.	1+2+2 +2	7M
(b)	Data – $n_1 = 1.50$; $n_2 = 1.48$	1M	
	N.A = ? θ = ?		
	$N.A = \sqrt{n_1^2 - n_2^2} = 0.244$	1M	3M
	$\therefore \theta = \sin^{-1}(N.A) = 14.1^\circ$	1M	
	(a)		
8	Temp/pressure sensor and	3M+	
	displacement sensor with	3M	
	diagrams and explanation	2M+ 2M	10M

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN | 1 | C | E | | | | | | | |

SUB CODE:21PHY22

CITY ENGINEERING COLLEGE
III Internal Test

Sem & Branch: 2nd/All branches
Sub Name: Engineering Physics
Max Marks: 40

Date:25/08/2022
Time: 10:30-12:00
Duration: 1:30 hr.

Note: Answer all Questions selecting any ONE FULL questions from each part

Q No.	Sub Q No.	Questions	Marks	CO's	BT Level
		PART-A			
1		Give an account of wave function in quantum mechanics. Set up time-independent one-dimensional Schrodinger's wave equation.	10	CO2	BT2
		OR			
2	a	Explain blackbody radiation spectrum with a suitable graph.	6	CO2	BT1
	b	The position and momentum of an electron with energy 1 KeV are determined. If the inherent uncertainty in the measurement of its position is 1 A^0, what is the minimum percentage uncertainty in its momentum.	4	CO2	BT5
		PART-B			
3		Explain wave-particle dualism, de-Broglie hypothesis. Derive the expression for de-Broglie wavelength for an accelerated electron.	10	CO2	BT4
		OR			
4		Explain the construction and working of X-ray diffractometer by mentioning the crystal size determination by Scherrer's equation.	10	CO5	BT4

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PART-C

5	a	Deduce Wein's law and Rayleigh jeans law from Planck's radiation law.	7	CO2	BT2
	b	Estimate the potential difference through which a proton is needed to be accelerated so that its de-Broglie wavelength becomes equal to 1 A^0, given that it's mass is 1.673×10^{-27} kg.	3		BT5
		OR			
6		Describe in brief the construction and working principle of Transmission electron microscope.	10	CO5	BT2
		PART-D			
7		Describe in brief the construction and working principle of Scanning electron microscope.	10	CO5	BT2
		OR			
8		Explain Heisenberg's uncertainty principle and prove that free electron does not exist inside the nucleus.	10	CO2	BT3

Course outcomes:

Co1: Understand various types of oscillations and their implications, the role of shock waves in various fields.

Co2: Compute Eigen values, Eigen functions, the momentum of atomic and subatomic particles using time independent Schrodinger 's wave equation.

Co3: Apprehend the basics of laser and optical fiber with different types and applications in various fields.

Co4: Understand electrical conductivity phenomena in solid materials.

Co4: Understand the various measurement techniques.

BT Levels:

BT1-Knowledge , BT2-Understand, BT3- Apply, BT4-Analyzing , BT5-Evaluate, BT6- Creating

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test III

Semester & Section: 2nd / C, D

Date: 25/08/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
	Part - A		
1	wave function explanation $\psi = Ae^{i(kx-\omega t)}$, $\lambda = \frac{h}{p}$	2M	
	arrive upto $\frac{1}{\lambda^2} = -\frac{1}{4\pi^2\psi}\frac{d^2\psi}{dx^2}$	4M	10 M
	arrive upto $\frac{d^2\psi}{dx^2} + \frac{8\pi m}{h^2}(E-V)\psi = 0$	4M	
	(OR)		
2 a	Blackbody def with diagram	2M	
	Explanation of graph with observations	4M	6M
b	Data - $E = 1\,keV = 1\times10^3\times1.6\times10^{-19}\,J$		
	$\Delta x = 1\,A^0 = 1\times10^{-10}\,m$	2M	
	percentage uncertainty in momentum $\Delta p_x = ?$	2M	4M
	$\Delta x\,\Delta p_x \geq \frac{h}{4\pi}$		
	$\% \Delta p_x = 3.1$		

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test III

Semester & Section: 2nd / C, D

Date: 25/8/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
	Part - B		
3	wave particle dualism explanation	2M	
	arrive upto $\lambda = \frac{h}{p}$, $P = mv$	4M	
	and $\lambda = \frac{1.226}{\sqrt{V}}$ nm	4M	10M
	(or)		
4	Construction, working of X-ray diffractometer	2M 4M	10M
	with Scherrer's eq^n	4M	
	Part - C		
5 (a)	Weins law and Rayleigh jeans law explanation.	2M	
	By using plancks radiation law arrive wein's law and	2M	6M
	Rayleigh jeans law $u_\lambda d\lambda = c_1 \lambda^{-4} e^{-c_2/\lambda T} d\lambda$ $u_\lambda d\lambda = 8\pi k T \lambda^{-4} d\lambda$	2M.	

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test III

Semester & Section: 2nd / C, D

Date: 25/08/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
5 (b)	Data:- $\lambda = 10^{-10}$ m $m = 1.673 \times 10^{-27}$ kg $V = ?$	1M	3M
	$\lambda = \frac{h}{\sqrt{2meV}}$, $V = \frac{h^2}{2me\lambda^2}$	2M	
	$= 0.082\ V$		
	(OR)		
6	Construction, working principle of Transmission electron microscope with diagrams	2M 4M 4M	10M
	Part-D		
7	Construction, working principle of Scanning electron microscope with Suitable diagrams	2M 4M 4M	10M

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test III

Semester & Section: 2nd / C, D

Date: 25/08/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
	(OR)		
8	Heisenberg Uncertainity principle	2M	
	statement with expressions	2M	
	Non existance of electron in the nucleus	2M	10M
	To prove $E \geq 85$ MeV	2M	
	and K.E of β particle is around 3 to 4 MeV	2M	

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Year : 2021 - 2022

Semester : Odd / Even ✓

Name of the Teacher : Dr K. Sujatha & Mrs. Nagashree G

Designation : Prof & Asst. Prof.

Department : Physics

	Sem/Branch	Subject Code	Subject
1.	II / All	21PHY22	Engineering Physics
2.			
3.			

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff	30/9/22	30/12/22	21/3/23	I/II Sem
HOD				
Principal				

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ATTENDANCE

Sl. No.	Reg. No.	Name	1	2	3	4	5	6	7	8	9	10	11
			22/06	22/07	22/09	22/10	22/11	22/13	22/14	22/16	22/17	22/18	22/20
1	1KE21CS002	Abhishek. M.G	L	1	2	3	4	4	5	6	6	7	8
2	004	Aditya R Ragate	L	2	3	4	4	5	6	7	7	7	8
3	008	Anand	L	2	3	4	5	6	6	7	7	8	9
4	012	Ankush Kumar	L	2	3	3	4	5	6	7	7	8	9
5	013	Ashish S. D	L	2	3	4	5	5	6	7	8	9	9
6	017	Bhavesh N	L	2	3	4	4	5	6	7	8	9	10
7	020	Bhavath Reddy. G	L	2	2	3	4	5	6	6	7	7	8
8	022	Bharath S	L	2	3	4	5	6	7	7	8	8	9
9	025	Chandrashekar M.R	L	2	3	4	5	6	7	8	8	9	10
10	026	Chethan H.S	L	2	3	4	5	6	6	6	7	7	7
11	029	Dashan K.M	L	2	3	4	5	6	7	8	8	8	9
12	033	Deepak K	L	2	3	4	5	6	7	8	8	9	10
13	034	Dhanush R	L	2	2	3	4	5	6	7	8	9	9
14	038	Ganesh Moti	L	2	3	4	5	6	7	8	9	9	10
15	039	Gangothri. V	L	2	3	4	5	6	6	7	8	9	9
16	042	Harsha Vardhan S.M	L	2	3	4	5	6	7	7	7	8	8
17	044	Harshitha J.K	L	2	3	4	5	6	7	7	8	8	9
18	045	Harshitha M	L	2	3	4	5	6	7	7	8	9	10
19	048	Harshitha S.P	L	2	3	4	5	6	7	7	8	8	8
20	049	Hasfath Khan	L	2	2	3	4	5	5	6	7	8	9
21	053	Indhora S	L	L	2	3	4	5	6	6	6	6	6
22	054	Jaishankar Reddy. V	L	2	3	4	5	6	7	8	9	9	10
23	058	Imdad ul haq V. I	-	-	-	-	1	2	3	4	5	6	7
24	056	Kavyashree V	L	2	3	4	4	5	6	6	7	8	9
25	058	Koushthana S	L	2	3	4	5	6	7	7	8	9	9
	No. of Absents												
	Initials												

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

12	13	14	15	16	17	18	19	20	21
22/21	22/22	22/24	22/24	22/24	22/24	22/24	22/24	22/24	22/24
9	9	10	11	12	13	14	15	16	16
9	9	9	10	10	11	12	12	13	14
10	11	12	13	14	15	16	17	18	19
10	11	11	12	13	14	15	15	16	17
10	11	12	13	14	15	16	17	18	19
10	10	11	12	12	13	14	15	16	17
9	9	10	11	12	13	14	15	16	17
10	10	11	12	12	12	13	14	15	16
11	11	12	13	14	15	16	17	18	19
8	9	10	11	11	11	12	13	14	15
10	11	12	13	14	14	15	16	17	18
11	11	11	12	13	14	15	16	17	17
10	11	12	13	14	15	16	17	18	19
11	12	13	14	15	16	17	18	19	20
10	11	12	13	13	14	15	16	17	17
9	9	10	11	12	12	13	14	15	16
10	11	12	13	14	15	16	17	18	19
11	12	13	14	15	16	17	18	19	20
9	10	11	12	13	14	15	16	17	18
10	11	12	13	13	14	16	16	17	18
7	8	8	9	9	10	11	12	13	14
11	11	12	13	14	15	16	17	18	19
8	9	10	11	12	12	13	14	15	16
10	11	12	13	14	15	16	17	18	19
10	11	12	13	14	15	16	17	18	19

ATTENDANCE

Sl. No.	Reg. No.	Name	06/06/22	07/06/22	08/06/22	10/06/22	11/06/22	13/06/22	14/06/22	16/06/22	17/06/22	18/06/22	20/06/22
			1	2	3	4	5	6	7	8	9	10	11
26	059	Keerthana U	-	1	2	3	4	5	5	6	7	8	9
27	060	Kiran M	1	2	3	3	4	5	5	6	7	8	9
28	061	Kishan A	1	1	2	3	4	5	6	7	8	9	10
29	068	Meghana N	1	2	2	3	4	5	6	6	7	8	9
30	069	Mikhisha Kaaibe	1	2	2	3	3	4	5	6	7	8	9
31	070	Mohammad Jibaz	1	2	3	4	4	5	6	7	8	9	10
32	072	Mohd. Dawood	1	2	3	4	5	6	7	8	9	10	11
33	077	Mohd. Safwaan shoaibb. A	1	1	2	3	4	5	5	6	7	8	9
34	079	Mohan Krishna. D	1	2	3	4	5	6	6	7	8	8	9
35	080	Monika R	1	2	3	4	5	6	7	7	8	9	9
36	084	Nisarga M.U	1	2	3	4	4	5	6	7	8	8	9
37	086	Nivedhtha R.D	1	2	3	4	5	6	7	8	9	10	11
38	088	P. Shamanth	1	2	3	3	4	5	6	7	8	9	10
39	091	Prajna Dattatraya	1	2	3	4	5	5	6	6	7	8	9
40	101	Ratnesh	1	1	2	3	4	5	5	6	7	8	9
41	104	Rimah Maral	1	2	2	3	4	5	5	6	7	8	9
42	106	Rupla S. Jadav	1	2	2	3	4	5	6	7	8	9	9
43	108	S. Naina shalbt	1	2	3	4	5	6	7	8	9	9	10
44	110	Saif Ali Badal	1	2	3	4	5	5	6	7	8	9	10
45	143	Sannidhi N.D	1	2	3	4	5	6	7	8	8	9	10
46	114	Satish C	-	1	2	3	4	5	6	7	8	8	9
47	116	Sharath Sugimath	-	1	2	3	4	5	5	6	6	7	8
48	118	Shashank Rao L	1	2	3	4	5	6	7	8	9	9	10
49	119	Shashank T.S	1	2	3	3	4	5	5	6	7	7	8
50	120	Shilpa. S	1	2	3	4	5	6	6	7	8	9	10
	No. of Absents												
	Initials												

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kamakshipura Main Road, Bangalore-560061

21/6/22	22/6/22	23/6/22	24/6/22	25/6/22	27/6/22	28/6/22	29/6/22	30/6/22	1/7/22	2/7/22	
12	13	14	15	16	17	18	19	20	21		
10	11	12	13	14	15	16	17	18	19		
10	11	12	13	14	15	16	17	18	19		
11	12	13	14	15	16	16	17	18	19		
10	10	11	12	13	14	15	16	17	18		
10	10	11	12	12	13	14	15	16	17		
10	11	12	12	13	14	15	16	17	18		
12	12	14	14	14	15	16	17	18	19		
10	10	12	13	13	14	15	16	17	18		
10	11	12	12	12	13	14	15	16	17		
10	11	12	13	14	14	15	16	17	18		
10	11	12	12	13	14	15	16	17	17		
12	13	14	14	14	14	15	16	17	18		
11	12	13	14	14	15	16	17	18	19		
10	11	12	13	14	15	16	17	18	19		
10	10	11	12	12	13	14	15	15	16		
10	10	11	12	13	14	14	15	16	17		
10	10	11	12	12	13	14	15	16	17		
11	12	13	14	14	15	15	16	17	18		
11	11	12	13	13	14	15	16	17	18		
10	11	12	13	14	15	16	17	18	19		
10	11	12	12	13	14	14	15	16	17		
9	9	10	11	11	12	13	14	15	16		
11	12	13	14	15	16	17	18	19	20		
9	10	11	12	12	13	14	15	16	17		
11	12	12	13	14	15	16	17	18	19		

ATTENDANCE

Sl. No.	Reg. No.	Name	06	07	09	10	11	13	14	16	17	18	20
			22	22	22	22	22	22	22	22	22	22	22
			1	2	3	4	5	6	7	8	9	10	11
51	123	Shubha M	1	1	2	3	4	5	6	6	7	7	8
52	TCE21CS023	Bhavani. N		1	2	3	4	5	6	6	7	8	9
53													
54													
55													
56													
57													
58													
59													
60													
61													
62													
63													
64													
65													
66													
67													
68													
69													
70													
71													
72													
73													
74													
75													
	No. of Absents												
		ATTESTED COPY											
	Initials	PRINCIPAL CITY ENGINEERING COLLEGE Kamakshipura, Vijayapura, Kodigehalli, Bengaluru-560061											

06	07	09	10	11	13	14	16	17	18	20
22	22	22	22	22	22	22	22	22	22	22
21	22	23	24	25	26	27	28	29	30	31
32	33	34	35	36	37	38	39	40	41	42
43	44	45	46	47	48	49	50	51	52	53
54	55	56	57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72	73	74	75

CITY
ENGINEERING COLLEGE

DEPARTMENT OF BASIC SCIENCE
ACADEMIC YEAR 21-22 ODD SEMESTER
CIRCULAR

Ref No: CEC/BS/DAC/ACY/2021-22/OR/01 Date: 05-12-2021

This is to inform the members of Department Advisory Committee that meeting is scheduled on 14-12-2021 at 10: 00 AM in Physics Laboratory.

Agenda:

- Commencement of classes for 1st semester students
- Phase I Student Induction Programme for 1st semester students
- Conduction of Talents day
- Organizing value added courses/ certificate courses, seminars & webinars in the curriculum.

HOD
Dr. K Sujatha
Department of Physics

HEAD OF THE DEPT. OF PHYSICS
CITY ENGINEERING COLLEGE,
Doddakallasandra, Kanakapura Main Road,
BANGALORE - 560 062.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

DEPARTMENT OF BASIC SCIENCE

Department Advisory Committee Meeting

Date: 14-12-2021 & 15-12-2021
Time: 10:00 AM
Venue: Physics Laboratory

DAC Members Present:

Sl. No	Member Name	Designation	Role	Signature
1	Dr. P. Rajasekar	HOD & Professor	Convenor	
2	Mrs. Sunitha N	Assistant Professor	Member	
3	Mrs. Anu Radha U	Assistant Professor	Member	
4	Mrs. Sowmya P	Assistant Professor	Member	
5	Dr. K Sujatha	HOD & Professor	Member	
6	Mrs. Nagasree G	Assistant Professor	Member	
7	Mrs. Ashwini	Assistant Professor	Member	
8	Dr. Jyothi P	Associate Professor	Member	
9	Vanitha G R	Assistant Professor	Member	
10	Mrs. Gayatri	Assistant Professor	Member	
11	Mrs. Kalavathi	Assistant Professor	Member	
12	Mrs. Gana Priya	Assistant Professor	Member	
13	Mrs. Reena Patro	Assistant Professor	Member	

Agenda of the Meeting:

- Inauguration programme for 1st semester students on 21st December 2021.
- Commencement of orientation Programme from 22nd December 2021.
- Conduction of Talents day on 27th December 2021.
- Classes for 1st semester students will be from 4th January 2022.
- Organizing value added courses/ certificate courses in the curriculum like Entrepreneurship and innovation.
- Organizing seminars and webinars.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

Minutes of Meeting:

The members discussed suggestions for improvement and reviewed the meeting agenda.

- The committee decided to organize value added course on Entrepreneurship and innovation.
- It was discussed to conduct Talents day on 27th December 2021.
- Committee decided to conduct webinar on Introduction to Research Methodology.
- Committee members agreed in conducting a seminar on career guidance --Navigating Your Future.

Convenor
Dr. Rajasekhar. P
Department of Chemistry

Dr P. RAJASEKHAR,
M.Sc; M.Phil; Ph D
HEAD OF THE DEPT. OF CHEMISTRY
CITY ENGINEERING COLLEGE.
Doddakallasandra, Kanakapura Main Road
BANGALORE - 560 062.
Ph (O) 26669313 (M) 92428 92734

HOD
Dr. K Sujatha
Department of Physics

HEAD OF THE DEPT. OF PHYSICS
CITY ENGINEERING COLLEGE,
Doddakallasandra, Kanakapura Main Road,
BANGALORE - 560 062.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ
"ವಿಟಿಯು ಅಧಿನಿಯಮ ೧೯೯೪ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ
"ಜ್ಞಾನ ಸಂಗಮ", ಬೆಳಗಾವಿ-೫೯೦೦೧೮, ಕರ್ನಾಟಕ, ಭಾರತ

Visvesvaraya Technological University
(State University of Government of Karnataka Established as per the VTU Act, 1994)
"Jnana Sangama" Belagavi-590018, Karnataka, India
Phone: (0831) 2498100, Fax: (0831) 2405467, Website: vtu.ac.in

Dr. A. S. Deshpande B.E., M.Tech., Ph.D.
Registrar

Phone: (0831) 2498100
Fax: (0831) 2405467

Ref: VTU/BOS/A9/2020-21 / 4006

Date: 14 DEC 2021

NOTIFICATION

Subject: Commencement of **1st semester** of UG programs for the year 2021-22 regarding...

Reference: Hon'ble Vice-Chancellor's Approval dated: 04.12.2021

The academic calendar concerned to **1st semester** of Under-graduate programs of University is hereby notified as below-.

The Principals of Affiliated, Constituent and Autonomous Engineering Colleges are hereby informed to bring the content of this circular to the notice of all the concerned.

Sd/-
REGISTRAR

Encl: As mentioned above.

To,

1. The Principals of all affiliated/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The Chairpersons of all Departments, Centres for PG Studies in Belagavi, Kalaburgi, Muddenahalli, and Mysore.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director SMU CNC VTU Belagavi for uploading Academic Calendar on VTU website
5. PS to Registrar VTU Belagavi
6. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi

REGISTRAR

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Academic Calendar for 1st Semester of UG programs for the year 2021-22

Events	I semester B.E./B.Tech	I semester B.Arch/B.Plan
Commencement of ODD Semester	13.12.2021	13.12.2021
Last Working day of ODD Semester	30.03.2022	30.03.2022
Practical Examination	01.04.2022 To 08.04.2022	01.04.2022 To 08.04.2022
Theory Examinations	11.04.2022 To 23.04.2022	11.04.2022 To 23.04.2022
Internship	25.04.2022 To 14.05.2022	
Commencement of EVEN Semester	16.05.2022	16.05.2022

NOTE:

- The classroom sessions for **ODD** semesters should commence from the dates mentioned above.
- Academic duration includes **Students Induction Program** of 105 hours, the college has to plan to complete the same in blended mode within 10-12 days.
- The Institute needs to function for **six days** a week with additional hours (**10 hours per day**) (**Saturday is a full working day).** #if required the college can plan to have extra classes even on Sundays also.
- The faculty/staff shall be available to undertake any work assigned by the university.
- If any of the above dates are declared to be a holiday then the corresponding event will come into effect on the next working day.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by MHRD/UGC/AICTE/State Government.
- Academic Calendar is also applicable for **Autonomous Colleges.** In case if any changes are to be affected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

REGISTRAR

CITY ENGINEERING COLLEGE, BENGALURU-560061.
DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES ACADEMIC CALENDAR 2021-22 (ODD SEM)

DAY	Date	OCTOBER	Dat	NOVEMBER	Date	DECEMBER	Date	JANUARY	Date	FEBRUARY	Date	MARCH
FRI	1	STARTING OF 5th& 7th Semesters										
SAT	2	GANDHI					1					
SUN	3						2					
MON	4		1	KANNADA RAJYOTSAVA(DH)			3					
TUE	5		2				4	START OF 1ST SEM	1	PRACTICAL EXAMS 5TH& 7TH SEMESTERS	1	
WED	6	MAHALAYA AMAVASYA(DH)	3	NARAKA CHATURDASHI(DH)	1		5		2		2	
THU	7		4		2		6		3		3	
FRI	8		5	DEEPAVALI(DH)	3		7		4		4	
SAT	9	2ND SAT HOLIDAY	6		4		8	2ND SAT	5		5	
SUN	10		7		5		9		6		6	
MON	11		8		6	SECOND INTERNAL 5th&7th Semesters	10		7		7	
TUE	12		9	FIRST INTERNAL 5th& 7th Semesters	7		11		8		8	
WED	13		10		8		12		9		9	
THU	14	AYUDHA PUJA(DH)	11		9		13		10		10	
FRI	15	VIJAYA DASHAMI(DH)	12		10		14		11		11	
SAT	16		13	2ND SAT HOLIDAY	11	2ND SAT HOLIDAY	15		12	2ND SAT HOLIDAY	12	2ND SAT HOLIDAY
SUN	17		14		12		16		13		13	
MON	18	STARTING OF 3rd Semester	15		13	STARTING OF1st Semester	17		14		14	
TUE	19	ID MILAD(DH)	16		14	MOM ON CURRICULUM	18		15		15	
WED	20	VALMIKI JAYANTHI(DH)	17		15	MOM ON CURRICULUM ENRICHMENT	19		16		16	
THU	21		18		16		20		17	SECOND INTERNALS – 3RD SEM	17	THIRD INTERNAL – 3RD SEM
FRI	22		19		17		21		18		18	
SAT	23	4TH SATURDAY HOLIDAY	20	ALUMNI MEET & GRADUATION DAY	18		22	4TH SATURDAY HOLIDAY	19		19	
SUN	24		21		19		23		20		20	
MON	25		22	KANAKA JAYANTHI(DH)	20		24	FIRST INTERNALS – 1ST SEM	21	SECOND INTERNALS – 1ST SEM	21	THIRD INTERNALS – 1ST SEM
TUE	26		23		21	INAUGURATION DAY	25		22		22	
WED	27		24		22	ORIENTATION DAY	26		23		23	
THU	28		25		23		27		24		24	
FRI	29		26		24		28		25		25	
SAT	30		27	4TH SATURDAY HOLIDAY	25	4TH SATURDAY HOLIDAY	29				26	
SUN	31		28		26		30		27		27	
MON			29	FIRST INTERNAL - 3rd Sem	27	TALENTS DAY	31	LWD of 5th& 7th Sem	28		28	Last Working Day of 1st Semester30.03.2022

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

CITY ENGINEERING COLLEGE

ACADEMIC YEAR: 2021-22

DEPARTMENT OF BASICSCIENCE

COURSE PREFERENCE

Name of the Faculty: Dr. Sujatha K

Designation: Professor and HOD

Sl. No	Course Code and Name	Year/Semester
1.	21PHY12 ENGINEERING PHYSICS FOR B SECTION	2021/I

Signature of Faculty

Department of Physics

HOD

Department of Physics

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

ACADEMIC YEAR: 2022-23

DEPARTMENT OF BASICSCIENCE

COURSE PREFERENCE

Name of the Faculty: Mrs. Nagasree G

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1.	21PHY12 ENGINEERING PHYSICS FOR A SECTION	2021/I

Signature of Faculty

Department of Physics

HOD

Department of Physics

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

CITY ENGINEERING COLLEGE
TIME TABLE –FIRST SEMESTER DECEMBER – 2021-22
PHYSICS CYCLE

SECTION: A **ROOM NO: 007**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON	MAT	PHY	BREAK	EVN	EVN	LUNCH	←---PHYL/EVNL/ELEL /A1/A2/A3---→		
TUE	PHY	MAT		CIV	ELE(T)		EGH	EGH	EGHLA2
WED	CIV	←---PHYL		EVNL/ELEL /A2/A3/A1→			ELE	MAT	EGHLA3
THU	CIV	ELE		PHY(T)	IDT		←--- PHYL/EVNL/ELEL /A3/A1/A2---→		
FRI	ELE	MAT		PHY	CIV		EDUSAT/DEP/COLLEGE ACVIVITIES/LIBARARY		
SAT	ELE	PHY		CIV (T)	EGHLA1				

MAT- Dr. JYOTHI.P & PROF. VANITHA.G
CIV - Prof.Manjunath
IDT - Ms. Shwethashree
EVN - Dr. Karunakara, Prof.Anil, Prof.Shruthi
ELEL - Prof. Mallikarjuna.G.S & Prof.Ravindra.S

ELE - Prof. Mallikarjuna.G.S
PHY - Dr.K.Sujatha & Prof. Nagashree G
EGH, EGHL - New Staff
PHYL-Dr.K.Sujatha & Prof. Nagashree G

PROCTORS - Prof. Nagashree.G & Prof. Vanitha.G

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

HOD **PRINCIPAL**

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE
TIME TABLE –FIRST SEMESTER DECEMBER – 2021-22
PHYSICS CYCLE

SECTION: B **ROOM NO:A006**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON	CIV	MAT	BREAK	PHY	IDT	LUNCH	ELE	EGH	EGH
TUE	ELE	PHY		EVN	EVN		←--PHYL/ EVNL/ELEL/B1/B2/B3--→		
WED	MAT	ELE		CIV	PHY		←--PHYL/ EVNL/ELEL/B2/B3/B1--→		
THU	MAT	←--PHYL/		EVNL/ELEL/B3/B1/B2-----→			EGHLB1	EGHLB2	EGHLB3
FRI	PHY	ELE(T)		CIV	MAT		EDUSAT/DEP/COLLEGE ACVIVITIES/LIBARARY		
SAT	CIV	ELE		PHY(T)	MAT(T)				

MAT Dr.Jyothi.& Prof. Gayathri.A
EVN-Prof.Shruthi & Prof.Anil
IDTMs. Shwethashree
EVNL Dr.Karunakara, Prof.Shruthi & Prof. Anil
ELEL G Dr.Shalini & Prof.Ravindra,S

ELE Dr. Shalini
PHY - Dr.K.Sujatha & Prof Nagashree.G
EGH,EGHL - New Staff
PHYL Dr.K.Sujatha & Prof Nagashree
CIV Prof.Manjunath

PROCTORS - Prof.Gayathri.A & Prof. Shruthi

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

HOD **PRINCIPAL**

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

CITY ENGINEERING COLLEGE
TIME TABLE –FIRST SEMESTER DECEMBER – 2021-22
PHYSICS CYCLE

Dr. K. Sujatha **SUBJECT CODE: 21PHY12**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON			BREAK	B		LUNCH			
TUE		B					←----------PHYL/B1----------→		
WED					B		←----------PHYL/B2----------→		
THU		←PHYL/B3		PHYL/B3----------→					
FRI	B								
SAT				B(T)					

HOD

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

PRINCIPAL

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

CITY ENGINEERING COLLEGE
TIME TABLE –FIRST SEMESTER DECEMBER – 2021-22
PHYSICS CYCLE

Mrs. Nagashree. G **SUBJECT CODE: 21PHY12**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON		A	BREAK			LUNCH	←----------PHYL/A1----------→		
TUE	A								
WED		←PHYL/A2		PHYL/A2--------→					
THU				A(T)			←----------PHYL/A3----------→		
FRI				A					
SAT		A							

HOD

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

PRINCIPAL

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

I/II Semester

Engineering Physics			
Course Code	**21PHY12/22**	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	2:2:0:1	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03 Hours

Course objectives: This course(21PHY12/22) will enable the students to

- Learn the basic concepts of Physics which are essential in understanding and solving Engineering related challenges.
- Gain the knowledge of problem solving and its practical applications.
- Signify the application of sensitive instrumentation for Nano-scale system.

Teaching-Learning Process (General Instructions)

These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes.

1. Apart from conventional lecture methods various types of innovative teaching techniques through videos, animation films may be adopted so that the delivered lesson can progress the students in theoretical, applied and practical skills in physics.
2. State the necessity of physics in engineering studies and offer real life examples.
3. Seminars and Quizzes may be arranged for students in respective subjects to develop skills.
4. Encourage the students for group learning to improve their creativity and analytical skills.
5. While teaching show how every concepts can be applied to the real world. This helps the students to expand understanding level.
6. Support and guide the students for self-study.
7. Ask some higher order thinking questions in the class, which promotes critical thinking.
8. Inspire the students towards the studies by giving new ideas and examples.

Module-1

Oscillations and Waves: **08 Hours**

Free Oscillations: Basics of SHM, derivation of differential equation for SHM, Mechanical simple harmonic oscillators (spring constant by series and parallel combination), Equation of motion for free oscillations, Natural frequency of oscillations.

Damped Oscillations: Theory of damped oscillations (derivation), over damping, critical & under damping (only graphical representation), quality factor.

ForcedOscillations: Theory of forced oscillations (derivation) and resonance, sharpness of resonance.

Shock waves: Mach number, Properties of Shock waves, Construction and working of Reddy shock tube, applications of shock waves, Numerical problems.

Teaching-Learning Process	Chalk and talk, Power point presentation, Videos **Practical Topics**: 1.Spring in series and parallel combination **Self-study Component:** Basics of SHM

Module-2

Modern Physics & Quantum Mechanics: **08 Hours**

Introduction to blackbody radiation spectrum- Wien's law, Rayleigh Jean's law, Stefan -Boltzmann law and Planck's law (qualitative), Deduction of Wien's law and Rayleigh Jeans law from Planck's law. Wave-Particle dualism, de-Broglie hypothesis, de-Broglie wavelength. Heisenberg's uncertainty principle and its physical significance, Application of uncertainty principle-Non-existence of electron in the nucleus (relativistic case), Wave function- Properties, Physical significance, Probability density, Normalization, Eigen values and Eigen functions. Time independent Schrödinger wave equation. Particle in a box- Energy Eigen values and probability densities, Numerical problems.

Teaching-Learning Process	Chalk and talk, Power point presentation, Videos **Practical Topics:** 1.Verification of Stefan's Law **Self-study Component:** Wave- Particle dualism, de-Broglie hypothesis , de- Broglie wavelength.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

<table>
<tr><td colspan="2">Module-3</td></tr>
<tr><td colspan="2"><u>Lasers & Optical Fibers:</u> 08 Hours
Lasers: Interaction of radiation with matter, Einstein's coefficients (derivation of expression for energy density). Requisites of a Laser system. Conditions for Laser action. Principle, Construction and working of CO_2 and semiconductor Lasers. Application of Lasers in Defence (Laser range finder) and medical applications- Eye surgery and skin treatment.
Optical Fibers: Propagation mechanism, angle of acceptance, Numerical aperture, Modes of propagation, Types of optical fibers, Attenuation and Mention of expression for attenuation coefficient. Discussion of block diagram of point to point communication, Optical fiber sensors- Intensity based displacement sensor and Temperature sensor based</td></tr>
<tr><td>Teaching-Learning Process</td><td>Chalk and talk, Power point presentation, Videos
Practical Topics:
1. wavelength of LASER source
2. Optical fiber
Self-study Component: Properties of Laser and comparison with ordinary source</td></tr>
<tr><td colspan="2">Module-4</td></tr>
<tr><td colspan="2"><u>Electrical Conductivity in Solids</u>: 08 Hours
Classical free electron theory: Drude- Lorentz theory & Assumptions, Expression for electrical conductivity (no derivation), Failures of classical free-electron theory.
Quantum free electron theory: Assumptions, Density of states (no derivation), Fermi-energy, Fermi factor & its temperature dependence, Fermi - Dirac Statistics, Expression for electrical conductivity (derivation), Merits of Quantum free electron theory.
Physics of Semiconductors: Fermi level in intrinsic semiconductors, Expression for concentration of electrons in conduction band, Holes concentration in valance band (only mention the expression), Conductivity of semiconductors (derivation), Hall effect, Expression for Hall coefficient (derivation).
Dielectrics: Electric dipole, Dipole moment, Polarization of dielectric materials, Types of polarizations. Qualitative treatment of Internal field in solids for one dimensional infinite array of dipoles (Lorentz field). Claussius-Mossotti equation (derivation), Numerical problems.</td></tr>
<tr><td>Teaching-Learning Process</td><td>Chalk and talk, Power point presentation, Videos
Practical Topics:
1.Fermi Energy of a material
2. Resistivity of a material
Self-study Component: Electric dipole, Dipole moment, Polarization of dielectric materials</td></tr>
<tr><td colspan="2">Module-5</td></tr>
<tr><td colspan="2"><u>Material Characterization Techniques and Instrumentation</u>: 08 Hours
Introduction to materials: Nanomaterials and nanocomposites. Principle, construction and working of X-ray Diffractometer, crystal size determination by Scherrer equation. Principle, construction, working and applications of -Atomic Force Microscope (AFM), X-ray Photoelectron Spectroscope (XPS), Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM) Numerical problems.</td></tr>
<tr><td>Teaching-Learning Process</td><td>Chalk and talk, Power point presentation, Videos
Self study Component:X-ray diffractometer.</td></tr>
<tr><td colspan="2">Course outcome (Course Skill Set)
At the end of the course the student will be able to :
1. Interpret the types of mechanical vibrations and their applications, the role of Shock waves in various fields.
2. Demonstrate the quantisation of energy for microscopic system.
3. App[y LASER and Optical fibers in opto electronic system.
4. Illustrate merits of quantum free electron theory and applications of Hall effect.
5. Analyse the importance of XRD and Electron Microscopy in Nano material characterization.</td></tr>
</table>

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50)in the semester-end examination(SEE).

Continuous Internal Evaluation:

Three Unit Tests each of **20 Marks (duration 01 hour**)

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 15th week of the semester

Two assignments each of **10 Marks**

4. First assignment at the end of 4th week of the semester
5. Second assignment at the end of 9th week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks** (**duration 01 hours**)

6. At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours)**

1. The question paper will have ten questions. Each question is set for 20 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

The students have to answer 5 full questions, selecting one full question from each module.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Suggested Learning Resources:

Text Books:

1. A Text book of Engineering Physics- M.N. Avadhanulu and P.G. Kshirsagar, 10th revised Ed, S. Chand. & Company Ltd, New Delhi.
2. An Introduction to Lasers theory and applications by M.N.Avadhanulu and P.S.Hemne revised Edition 2012 . S. Chand and company Ltd -New Delhi.
3. Engineering Physics-Gaur and Gupta-Dhanpat Rai Publications-2017.
4. Concepts of Modern Physics-Arthur Beiser: 6th Ed;Tata McGraw Hill Edu Pvt Ltd- New Delhi 2006.
5. X-ray diffraction- B E Warren published by Courier Corporation.
6. Nano Composite Materials-Synthesis, Properties and Applications, J. Parameswaranpillai., N.Hameed, T.Kurian, Y. Yu, CRC Press.
7. Fundamentals of Fibre Optics in Telecommunication & Sensor Systems, B.P. Pal, New Age International Publishers.

Reference Books:

1. Introduction to Mechanics — M.K. Verma: 2nd Ed, University Press(India) Pvt Ltd, Hyderabad 2009.
2. Lasers and Non Linear Optics – B.B. Laud, 3rd Ed, New Age International Publishers 2011.
3. LASERS Principles, Types and Applications by K.R. Nambiar-New Age International Publishers.
4. Solid State Physics-S O Pillai, 8th Ed- New Age International Publishers-2018.
5. Shock waves made simple- Chintoo S Kumar, K Takayama and KPJ Reddy: Willey India Pvt. Ltd. New Delhi2014.
6. Materials Characterization Techniques-Sam Zhang, Lin Li, Ashok Kumar, CRC Press, First Edition, 2008.
7. Characterization of Materials- Mitra P.K . Prentice Hall India Learning Private Limited.
8. Nanoscience and Nanotechnology: Fundamentals to Frontiers – M.S.Ramachandra Rao & Shubra Singh, Wiley India Pvt Ltd .

Web links and Video Lectures (e-Resources):

https://www.britannica.com/technology/laser,k
https://nptel.ac.in/courses/115/102/115102124/
https://nptel.ac.in/courses/115/104/115104096/
http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html
https://onlinecourses.nptel.ac.in/noc20_mm14/preview

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

http://nptel.ac.in
https://swayam.gov.in
https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF PHYSICS

LESSON PLAN FOR ODD SEMESTER FOR ACADEMIC YEAR 2021 - 22

Course Title: **Engineering Physics**	Course Code : 21PHY12/22
Total contact hours: L:T:P:S :: 2:2:0:1	End Term Marks : 100
CIE Marks : 50 SEE Marks :50	
Semester : I	Academic year : 2021-22
Lesson plan Author: Dr K Sujatha and Nagashree G	Date :25/12/2021

Course Objective:

.Understand the concept of SHM,shock waves and their applications.

.Understand the basic concepts in quantum mechanics and its applications to diverse areas like lasers,optical fibers and electrical properties of solids.

.Gain the knowledge of newer concepts in physics for the better appreciation of instrumentation technology.

Course Outcomes:

After studying this course, students will be able to:

1.Understand various types of oscillations and their implications,the role of Shock waves in various fields.

2.Compute Eigen values,Eigen functions,momentum of atomic and subatomic particles using time independent 1-D Scrodinger's wave equation.

3.Apprehend the basics of laser and optical fiber with different types and their applications in various fields.

4.Understand electricsl conductivity phenomenon in solid materials.

5.Understand the various measurement techniques.

MODULE-1

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
1	1	Oscillations and waves: Free oscillation:Basics of SHM,derivation of equation of SHM,Mechanical si,ple harmonic oscillator,	R,U	CO1
	2	equation of motion for free oscillation ,natural frequency of oscillation	R,U	CO1
	3	Damped oscillations: Theory of damped oscillations,over damping,critical and under damping,	R,U	CO1
	4	quality factor	R,U,E,C	CO1
2	1	Forced oscillations intoduction	R,U	CO1
	2	Theory of forced oscillations,derivation	R,U	CO1
	3	Resonance	R,U	CO1
	4	Sharpness of resonance	R,U	CO1
3	1	Shock waves: Mach number	R,U	CO1
	2	,properties of shock waves,	R,U	CO1
	3	construction and working of reddy shock tube,	R,U	CO1
	4	applications of shock waves,numerical problems.	R,U	CO1

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

MODULE-2

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
4	1	Introduction to blackbody radiation spectrum	R,U	CO2
	2	Wein's law ,Rayleigh jeans law and planck's law	R,U	CO2
	3	Deduction of Wein's law ,Rayleigh jeans law from planck's law	R,U	CO2
	4	Wave particle dualism,	R,U	CO2
5	1	de Broglie hypothesis, de Broglie wavelength	R,U	CO2
	2	Heisenberg's uncertainity principle and its physical significance	R,U	CO2
	3	Applications of uncertainity principle	R,U	CO2
	4	Wave function, properties,physical significance	R,U	CO2
6	1	Probability density,normalization	R,U	CO3
	2	Eigen values and Eigen functions	R,U	CO3
	3	Time independent scrodinger wave equation	R,U	CO3
	4	Particle in abox,Eigenenergy values and probability densities	R,U	CO3
	5	Numerical problems	R,U	CO3

MODULE-3

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
7	1	Lasers:Interaction of radiation and matter	R,U	CO4
	2	Einsteins coefficients(expression for energy density derivation)	R,U	CO4
	3	Requisites of a laser system	R,U,E	CO4
	4	Condition for laser action	R,U	CO4
8	1	Principle construction and working of carbondioxide laser	R,U	CO4
	2	Construction and working of semiconductor laser	R,U	CO4
	3	Applications of laser in defence	R,U	CO4
	4	Medical applications:eye surgery and skin treatment	R,U	CO4
	1	Optical fibers: Propagation mechanism,angle of acceptance,numerical aperture	R,U,C	CO4
9	2	Modes of propagation,types of optical fibers	R,U, A1	CO4
	3	Attenuation and its expression	R,U	CO4
	4	Discussion of Point to point communication system,applications	R,U	CO4
	5	Merits and demerits,numericals	R,U	CO4

MODULE-4

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
10	1	Electrical conductivity in solids: Classical free electron theory-Free eletron concept, Drude Lorentz theory and assumptions	R,U,	CO5
	2	Drift velocity,mean free path,mean collision time	R,U	CO5
	3	Expression for electrical conductivity,failures of classical free theory	R,U	CO5
	4	Quatum free electron theory:Assumptions,density of states,Fermi energy,Fermi factor	R,U	CO5
11	1	Fermi-dirac statistics,expression for electrical conductivity	R,U	CO5
	2	Merits of quantum free electron theory	R,U	CO5
	3	Physics of semiconductors:Fermi level in intrinsic semiconductors	R,U	CO5

MODULE-5

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
12	1	Introduction	R,U,A2	CO6
	2	boiler troubles scale & sludge formation	R,U	CO6
	3	Priming & foaming boiler corrosion	R,U	CO6
	4	Determination of DO, BOD	R,U	CO6
13	1	COD numerical problems	R,U,E	CO6
	2	Sewage treatment, primary method	R,U	CO6
	3	secondary and tertiary method	R,U	CO6
	4	softening of water by ion exchange method	R,U	CO6
14	1	Desalination of sea water by reverse osmosis & electrodialysis	R,U	CO6
	2	Introduction, properties Synthesis bottom up approach	R,U,A1,C	CO7
	3	sol-gel precipitation	R,U	CO7
	4	gas condensation	R,U	CO7
15	1	Nano materials – Nano clusters	R,U	CO7
	2	carbon Nano tubes	R,U	CO7
	3	Nano composites, fullerenes	R,U	CO7
	4	Nano wires, Nano rods, dendrimes	R,U,A1,C	CO7

Bloom's Taxonomy Level

R-Remembering U-Understanding A1-Applying A2-Analysing E-Evaluating C-Creating

Text Books:

1. B.S. Jai Prakash, R. Venugopal, Sivakumaraiah&pushpaIyengar, "Chemistry for Engineering Students" , Subhash publications, Bangalore
2. R.V. Gadag& A. NityanandaShetty "Engineering Chemistry"I.KInternationsl publishing House private Ltd. New Delhi.
3. P.C. Jain & Monica Jain, "Engineering Chemistry" DhanpatRai publications, New Delhi.

Reference Books:

1. O.G. Palanna, "Engineering Chemistry", Tata McGraw Hill Education Pvt. Ltd. New Delhi, Fourth Reprint.
2. G.A. Ozin & A.C. Arsenault, "Nano Chemistry A Chemical Approach to Nano materials" RSC publishing,2005
3. "Wiley Engineering Chemistry", Wiley India Pvt. Ltd. New Delhi. Second edition
4. V.R. Gowariker, N.V.Vishwanath&J.Sreedhar, "Polymer Science", Wiley Eastern Ltd.

List of URLs-Text Books, Notes, Multimedia Content, etc

- www.bookspar.com/engineering-vtu-note
- https//www.smartzworld.com/notes/engineering-chemisry
- www.LearnEngg.com
- www.kprblogin/cse/sem1/engineering-chemistry-video-lectures

www.nptel.ac.in

Signature of Staff **Signature of HOD**

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

Question Bank

Course Name: Engineering Physics **Course Code: 21PHYS12**

Semester: I **Section: A, B**

MODULE I

Oscillation and Waves:

1. Define Simple Harmonic Motion. Derive the equation of motion foe SHM.
2. Derive the expression for force constants for series and parallel combination of spring.
3. Explain how Complex notation Phasor representation is represented.
4. Define free oscillations with example. Mention the equation of motion of natural frequency of vibration.
5. What are Damped oscillations. Give the theory. Discuss the case of under damping, over damping and critical damping.
6.Define Quality factor with equation. Give its Physical significance.
7. What are Forced Oscillations Derive the expressions for amplitude and Phase of Forced vibrations. Explain all the three cases.
8. Write a short note on a) Sharpness of Resonance b) Helmoltz Resonator

Shock waves

1. Define Mach Number and Mach angle
2.Distinguish between Acoustic, Ultrasonic, subsonic, supersonic, transonic and hypersonic waves.
3. What are shock waves and mention the properties of shock waves.
4. Explain Control Volume
5.State and explain the law of conservation of mass, momentum and energy with expressions.
6.Describe the construction and working of Reddy Shock tube experiment.
7. What are the applications of Shock waves

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

MODULE II

MODERN PHYSICS

1.Explain energy distribution in the spectrum of blackbody.
2.What is blackbody . Discuss Wein's law and its limitations.
3.State and explain Rayleigh jean's law. Explain ultraviolet catastrophe.
4.State Planck's law of radiation and deduce wein's law and Rayleigh jean's law.
5.Explain Compton effect and give its physical significance?

6. What is de Broglie concept of matter waves? Show that de Broglie wavelength for an electron accelerated by a potential difference $\lambda=1.226/\sqrt{v}$ nm

7.Define group velocity and phase velocity . Derive the relation between them.
8.Derive the relation between group velocity and particle velocity.
9. What are the characteristics of matter waves?

QUANTUM MECHANICS

1.Explain Heisenberg's uncertainty principle. Give its physical significance?
2.Show that a free electron cannot exist within the nucleus of an atom using Heisenberg's uncertainty principle.
3.Set up time-independent one-dimension Schrodinger wave equation.
4.Explain the physical significance and normalization of a wave function.
5. What is a wave function and What are its properties?
6.Solve the Schrodinger wave equation for the allowed energy values in the case of particle in a box?
7.Discuss the wave functions ,probability densities and energy levels for particle in an infinite potential well.
8.Explain energy Eigen values for a free particle?

MODULE III

LASERS

1.Discuss the three possible ways through which radiation and matter interaction can take place with neat sketches.
2a).What are the requirements of a laser system.
b)Discuss the condition required for laser action.
3.Obtain an expression for energy density of radiation in terms of Einstein coefficient under equilibrium condition.
4.Describe the construction and working ofco_2 laser with the help of energy level diagram.
5.Explain the construction and working of semiconductor laser.

6.Describe briefly the application of lasers in welding, cutting, and drilling.
7.Describe the construction and reconstruction processes in holography with the help of suitable diagram and some applications.

8.Explain how to measure of pollutants in the atmosphere with the help of a diagram.

OPTICAL FIBRES

1.Explain the construction & working principle of optical fibres.
2.Explain how an optical fibre functions as a wave guide.
3.What is numerical aperture? Obtain an expression for numerical aperture in terms of refractive indices of core & cladding & then arrive at the condition for propagation.

4.Discuss the different types of optical fibres with suitable diagrams.
5.What is attenuation in an optical fibre ? Explain the different mechanism of attenuation.

6.Describe point to point communication system using optical fibres with the help of a block diagram and mention its advantages & disadvantages.

MODULE IV

ELECTRICAL CONDUCTIVITY IN SOLIDS:

1. What are the assumptions of classical free electron theory and the failures of classical free electron theory .
2.What are the assumptions of Quantum free electron theory.
3.Define density of states and mention the expression for density of states.
4.Explain Fermi level, Fermi energy, Fermi-Dirac statistics.
5.Define Fermi Factor. Discuss the variation of Fermi Factor on different conditions of temperature and energy.
6.Derive the expression for Fermi energy at zero Kelvin. Mention the expression for Fermi velocity and Fermi temperature.
7. Discuss the success of Quantum free electron theory.
8.Discuss the Fermi level in intrinsic semiconductor. Mention the expression for electron and hole concentration in intrinsic semiconductor.
9.Derive the relation between Fermi energy and energy gap for an intrinsic semiconductor.
10.Derive the expression for electrical conductivity of semiconductors.
11.What is Hall Effect? Obtain the expression for Hall voltage in terms of Hall coefficient.
12.What are dielectric materials .Explain the types of dielectric materials. Discuss solid, liquid and gaseous dielectric with one example each.
13.Explain polarization and the types of polarization. Mention the relation between dielectric constant and polarization.
14.Define internal field in case of solids and mention its expression for one dimensional case, three dimensional caseand Lorentz field.
15.Derive Clausius-Mossotti equation.
16.Mention the application of dielectric in transformers.

CITY ENGINEERING COLLEGE

MODULE V

Nano Materials

1.What are Nano materials? Discuss about mesoscopic state?
2.Explain density of states in various quantum structures?
3.Explain Top-down & Bottom-up approach?
4.Explain Ball milling method with the help of suitable diagrams?
5.Describe Sol-Gel method of producing Nano Materials?
6.Write a note on Carbon Nano tubes?
7. Describe arc discharge method of obtaining CNTs with the help of a diagram.
8. Write a note on Pyrolysis method of obtaining CNT
9. Describe the principle, construction and working of a scanning electron microscope?

Staff

Mrs. Nagasree G
Department of Physics

HOD

Dr. Sujatha
Department of Physics

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

Assignment Questions

Odd Semester 21-22

Course Name: Engineering Physics **Course Code: 21PHYS12**

Semester: I **Section: A, B**

MODULE I

Oscillation and Waves:

1. Define Simple Harmonic Motion. Derive the equation of motion foe SHM.
2. Derive the expression for force constants for series and parallel combination of spring.
3. Explain how Complex notation Phasor representation is represented.
4. Define free oscillations with example. Mention the equation of motion of natural frequency of vibration.
5. What are Damped oscillations. Give the theory. Discuss the case of under damping, over damping and critical damping.
6.Define Quality factor with equation. Give its Physical significance.
7. What are Forced Oscillations Derive the expressions for amplitude and Phase of Forced vibrations. Explain all the three cases.
8. Write a short note on a) Sharpness of Resonance b) Helmoltz Resonator

Shock waves

1. Define Mach Number and Mach angle
2.Distinguish between Acoustic, Ultrasonic, subsonic, supersonic, transonic and hypersonic waves.
3. What are shock waves and mention the properties of shock waves.
4. Explain Control Volume
5.State and explain the law of conservation of mass, momentum and energy with expressions.
6.Describe the construction and working of Reddy Shock tube experiment.
7. What are the applications of Shock waves

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

MODULE II

MODERN PHYSICS

1.Explain energy distribution in the spectrum of blackbody.
2.What is blackbody . Discuss Wein's law and its limitations.
3.State and explain Rayleigh jean's law. Explain ultraviolet catastrophe.
4.State Planck's law of radiation and deduce wein's law and Rayleigh jean's law.
5.Explain Compton effect and give its physical significance?

6. What is de Broglie concept of matter waves? Show that de Broglie wavelength for an electron accelerated by a potential difference $\lambda=1.226/\sqrt{v}$ nm

7.Define group velocity and phase velocity . Derive the relation between them.
8.Derive the relation between group velocity and particle velocity.
9. What are the characteristics of matter waves?

QUANTUM MECHANICS

1.Explain Heisenberg's uncertainty principle. Give its physical significance?
2.Show that a free electron cannot exist within the nucleus of an atom using Heisenberg's uncertainty principle.
3.Set up time-independent one-dimension Schrodinger wave equation.
4.Explain the physical significance and normalization of a wave function.
5. What is a wave function and What are its properties?
6.Solve the Schrodinger wave equation for the allowed energy values in the case of particle in a box?
7.Discuss the wave functions ,probability densities and energy levels for particle in an infinite potential well.
8.Explain energy Eigen values for a free particle?

MODULE III

LASERS

1.Discuss the three possible ways through which radiation and matter interaction can take place with neat sketches.
2a).What are the requirements of a laser system.
b)Discuss the condition required for laser action. .
3.Obtain an expression for energy density of radiation in terms of Einstein coefficient under equilibrium condition.
4.Describe the construction and working ofco_2 laser with the help of energy level diagram.
5.Explain the construction and working of semiconductor laser.

6.Describe briefly the application of lasers in welding, cutting, and drilling.
7.Describe the construction and reconstruction processes in holography with the help of suitable diagram and some applications.

8.Explain how to measure of pollutants in the atmosphere with the help of a diagram.

OPTICAL FIBRES

1.Explain the construction & working principle of optical fibres.
2.Explain how an optical fibre functions as a wave guide.
3.What is numerical aperture? Obtain an expression for numerical aperture in terms of refractive indices of core & cladding & then arrive at the condition for propagation.

4.Discuss the different types of optical fibres with suitable diagrams.
5.What is attenuation in an optical fibre ? Explain the different mechanism of attenuation.

6.Describe point to point communication system using optical fibres with the help of a block diagram and mention its advantages & disadvantages.

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

MODULE IV

ELECTRICAL CONDUCTIVITY IN SOLIDS:

1. What are the assumptions of classical free electron theory and the failures of classical free electron theory .
2.What are the assumptions of Quantum free electron theory.
3.Define density of states and mention the expression for density of states.
4.Explain Fermi level, Fermi energy, Fermi-Dirac statistics.
5.Define Fermi Factor. Discuss the variation of Fermi Factor on different conditions of temperature and energy.
6.Derive the expression for Fermi energy at zero Kelvin. Mention the expression for Fermi velocity and Fermi temperature.
7. Discuss the success of Quantum free electron theory.
8.Discuss the Fermi level in intrinsic semiconductor. Mention the expression for electron and hole concentration in intrinsic semiconductor.
9.Derive the relation between Fermi energy and energy gap for an intrinsic semiconductor.
10.Derive the expression for electrical conductivity of semiconductors.
11.What is Hall Effect? Obtain the expression for Hall voltage in terms of Hall coefficient.
12.What are dielectric materials .Explain the types of dielectric materials. Discuss solid, liquid and gaseous dielectric with one example each.
13.Explain polarization and the types of polarization. Mention the relation between dielectric constant and polarization.
14.Define internal field in case of solids and mention its expression for one dimensional case, three dimensional caseand Lorentz field.
15.Derive Clausius-Mossotti equation.
16.Mention the application of dielectric in transformers.

CITY ENGINEERING COLLEGE

MODULE V

Nano Materials

1.What are Nano materials? Discuss about mesoscopic state?
2.Explain density of states in various quantum structures?
3.Explain Top-down & Bottom-up approach?
4.Explain Ball milling method with the help of suitable diagrams?
5.Describe Sol-Gel method of producing Nano Materials?
6.Write a note on Carbon Nano tubes?
7. Describe arc discharge method of obtaining CNTs with the help of a diagram.
8. Write a note on Pyrolysis method of obtaining CNT
9. Describe the principle, construction and working of a scanning electron microscope?

Staff

Mrs. Nagasree G
Department of Physics

HOD

Dr. Sujatha
Department of Physics

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN	1	C	E							

SUB CODE:21PHY12

CITY ENGINEERING COLLEGE

I Internal Test

Sem & Branch: 1st /All branches | **Date:25/01/2022**
Sub Name:Engineering Physics | **Time:10:30-12:00**
Max Marks: 40 | **Duration: 1:30 hr.**

Note: Answer all Questions selecting any ONE FULL questions from each part

Q No.	Sub Q No.	Questions	Marks	CO's
		PART-A		
1	a	Obtain an expression for energy density of radiation under equilibrium condition in terms of Einstein's coefficients.	10	CO4
		OR		
2	a	Define SHM. Mention their characteristics.	6	CO3
	b	A mass 0.5 kg causes an extension 0.03 m in a spring and the system is set for oscillations. Find (i) force constant K of the spring (ii) angular frequency ω and (iii) period T of the resulting oscillation	4	CO3
		PART-B		
3	a	What are damped oscillations? Obtain the general solution for damped vibrations by determining the constants.	10	CO4
		OR		
4	a	Describe how a laser range finder is made use of in defense.	6	CO4
	b	The ratio of population of two energy levels is 1.059×10^{-30}. Find the wavelength of light emitted by spontaneous emission by 330 k.	4	CO4

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PART-C

5	a	Describe the construction and working of $C0_2$ laser with suitable diagrams.	10	CO4

OR

6	a	What are free oscillations. Derive the expression for the same mentioning the expression for frequency and time period.	10	CO4

PART-D

7	a	Derive the expressions for force constants for series and parallel combination of springs.	6	CO3
	b	A free particle is executing simple harmonic motion in a straight line. The maximum velocity it attains during oscillation is 62.8 m/s . Find the frequency of oscillation, if its amplitude is 0.5 m.	4	CO3

OR

8	a	Discuss the condition for laser action.	6	CO4
	b	A pulsed laser emits photons of wavelength 780 nm with 20 mW average power /pulse. Calculate the number of photons contained in each pulse if the pulse duration is 10 ns.	4	CO4

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test ... I ...

Semester & Section: Ist / A, B

Date: 25/01/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
	Part - A		
(1)	Explanation of all three cases	3M	
	arrive up to $v_d = \frac{A_{21}}{B_{21}\left(\frac{B_{12}}{B_{21}} e^{h\nu/kT} - 1\right)}$	3M	10M
	arrive up to $v_d = \frac{A}{B\left(e^{h\nu/kT} - 1\right)}$	4M	
	(OR)		
(2) (a)	Definition of SHM	2M	6M
	characteristics of SHM	4M	
(b)	Given $x = -0.03$ m, $m = 0.5$ kg		
	To find K, ω & T		
	W.K.T $F = mg = 0.5 \times 9.8$ N		
	$F_x = -4.9$ N	1M	4M
	$K = \frac{-F_x}{x} = \frac{-4.9}{-0.03} = 163.3$ N/m	1M	
	$\omega = \sqrt{\frac{K}{m}} = \sqrt{\frac{163.3}{0.5}} = 18.1$ rad/s	1M	
	$f = \frac{\omega}{2\pi} = 2.877$ Hz., $T = \frac{1}{f} = 0.35$ s	1M	

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF ..... PHYSICS .....

SCHEME FOR VALUATION_

Internal Test ... I .....

Semester & Section: Ist / A, B

Date: 25/01/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
	Part-B		
(3)	damped Oscillations explanation with examples	2M	
	arrive upto $\frac{d^2x}{dt^2} + 2b\frac{dx}{dt} + \omega^2 x = 0$	4M	10M
	arrive constants C and D	4M	
	(OR)		
(4) (a)	Explanation of laser range finder operation and principle with diagram	2M 3M 1M	6M
(b)	Data : $N_2/N_1 = 1.059 \times 10^{-30}$		
	$T = 330\ K$		
	To find : $\lambda = ?$		
	W.K.T $\frac{N_2}{N_1} = e^{-hc/\lambda KT}$	1M	
	Taking Natural log on both sides		
	$\ln\left(\frac{N_2}{N_1}\right) = -\left(\frac{hc}{\lambda KT}\right) \Rightarrow \lambda = \frac{hc}{KT \ln\left(\frac{N_2}{N_1}\right)}$	2M	4M
	$\lambda = 632\ nm$	1M	

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF PHYSICS

SCHEME FOR VALUATION_

Internal Test ... I ...

Semester & Section: Ist / A, B Date: 25/01/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
	Part-C		
5	Construction and working of CO_2 laser with Suitable diagrams & equations	3M + 3M	10M
	(OR)	2M + 2M	
6	Free oscillations explanation	2M	
	arrive upto $\frac{d^2x}{dt^2} + \frac{k}{m}x = 0$	6M	10M
	and $T = \frac{1}{2\pi}\sqrt{\frac{m}{k}}$ s, $\nu = 2\pi\sqrt{\frac{k}{m}}$ Hz	2M	
	part-D		
7 a	Diagrams and explanation.	2M	
	arrive upto $K_s = \frac{K_1 K_2}{K_1 + K_2}$		
	$\therefore \frac{1}{K_s} = \sum_{i=1}^{n} \frac{1}{k_i}$	2M	6M
	arrive upto $K_p = K_1 + K_2$	2M	
	$\therefore K_p = K_1 + K_2 + \cdots + K_n$		

Staff HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF PHYSICS

SCHEME FOR VALUATION_

Internal Test I

Semester & Section: IST / A, B

Date: 25/01/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
(b)	Data : $V_{max} = 62.8$ m/s amplitude, $a = 0.5$ m To find : frequency, $\nu = ?$ W.K.T $x = a\sin\omega t$ velocity, $V = \frac{dx}{dt} = a\omega\cos\omega t$ $= a\omega\sqrt{1-\sin^2\omega t}$ $= \omega\sqrt{a^2 - a^2\sin^2\omega t}$ $= \omega\sqrt{a^2 - x^2}$ The particle attains max velocity while passing through its equilibrium position, at which time, displacement is zero, $x=0$ $V_{max} = \omega\sqrt{a^2-0} = \omega a$ Angular frequency, $\omega = \frac{V_{max}}{a} = 125.6$ rad/s freq of oscillation, $\nu = \frac{\omega}{2\pi} = 20$ Hz	1M 1M 1M 1M	4M

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF PHYSICS

SCHEME FOR VALUATION

Internal Test I

Semester & Section: Ist / A, B

Date: 25/01/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
	(OR)		
8 (a)	Diagram and explanation	2M+4M	6M
(b)	Data : $\lambda = 780$ nm		
	$P = 20$ mW		
	$t = 10$ ns	1M	
	To find : $N = ?$		
	W.K.T $\Delta E = \frac{hc}{\lambda}$	1M	
	$= 2.550 \times 10^{-19}$ J		
	and $E =$ Power x duration		4M
	$E = Pxt$	1M	
	$= 2 \times 10^{-10}$ J		
	$N \times \Delta E = E$		
	$N = \frac{E}{\Delta E}$	1M	
	$= 7.86 \times 10^{8}$		

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

KS

USN | 1 | C | E | | | | | | | |

SUB CODE:21PHY12

CITY ENGINEERING COLLEGE

II Internal Test

Sem & Branch: 1st Sem/All Branches
Subject Name: Engineering Physics
Max Marks: 40

Date:03/03/2022
Time: 10:30-12:00
Duration: 1:30 hr.

Note: Answer all Questions selecting any ONE FULL questions from each part

Q No.	Sub Q No.	Questions	Marks	CO's	BT Level
		PART-A			
1		Define Numerical aperture and acceptance angle. With a neat diagram derive an expression for Numerical aperture in an optical fiber.	10	CO3	BT2
		OR			
2	a	What are shock waves? Mention the properties of shock waves.	6	CO1	BT1
	b	The distance between the two sensors in a shock tube is 150 mm. The time taken by a shock wave to travel this distance is 0.3 ms. If the velocity of a sound under the same condition is 340 m/s. Find the Mach number of the shock wave.	4	CO1	BT5
		PART-B			
3		Describe the construction and working of Reddy Shock tube.	10	CO1	BT4
		OR			
4		Define Fermi factor. Explain the dependence of Fermi factor on energy when $E>E_F$, $E<E_F$ and $E=E_F$ and also on temperature with suitable graph.	10	CO4	BT4
5	a	What is attenuation? Explain the different mechanisms through which attenuation takes place and mention attenuation coefficient.	7	CO3	BT2

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

	b	Find the attenuation in an optical fiber of length 500 m, when a light signal of power 100 mW emerges out of the fiber with a power 90 mW.	3		BT5
		OR			
6	a	Mention any three assumptions of classical free electron theory and discuss the success of quantum free electron theory.	6	CO4	BT2
	b	Calculate the probability of an electron occupying an energy level 0.02eV above the Fermi level at 200 K and 400 K in a material.	4	CO4	BT5
		PART-D			
7		Discuss the different types of optical fibers with suitable diagrams.	07	CO3	BT2
		The refractive indices of core and cladding are 1.50 and 1.48 respectively in an optical fiber. Find the numerical aperture and angle of acceptance.	03		BT5
		OR			
8		Define Fermi energy and derive the expression for electrical conductivity in metals on quantum model.	10	CO4	BT2

Course outcomes:

Co1: Understand various types of oscillations and their implications, the role of shock waves in various fields.

Co2: Compute Eigen values, Eigen functions, the momentum of atomic and subatomic particles using time independent Schrodinger 's wave equation.

Co3: Apprehend the basics of laser and optical fiber with different types and applications in various fields.

Co4: Understand electrical conductivity phenomena in solid materials.

Co4: Understand the various measurement techniques.

BT Levels:

BT1- Knowledge, BT2-Understand, BT3- Apply, BT4-Analyzing , BT5-Evaluate, BT6- Creating

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF ..... PHYSICS .....

SCHEME FOR VALUATION

Internal Test ..... II .....

Semester & Section: 1st / A, B Date: 03/03/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
	Part-A		
(1)	Numerical aperture, acceptance angle def	2M	
	diagram and explanation	4M	10M
	arrive upto $\sin\theta < N.A$, $N.A = \sqrt{n_1^2 - n_2^2}$	4M	
	(OR)		
(2) a)	shock waves explanation	2M	6M
	and properties	4M	
b)	Given $l = 150$ mm	1M	4M
	$t = 0.8$ ms		
	$a = 340$ m/s		
	$M = ?$ $u = 500$ m/s	2M	
	$M = \frac{u}{a}$ & $u = \frac{d}{t}$, $M = 1.47$	1M	
	Part-B		
(3)	diagram, construction and working of reddy shock tube	2+4+4	10M

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF PHYSICS

SCHEME FOR VALUATION

Internal Test II

Semester & Section: Ist / A,B Date: 03/03/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
(4)	(OR)		
	Fermi factor definition	2M	
	Explanation of all three cases	6M	10 M
	with suitable graph	2M	
	Part – C		
(5) (a)	attenuation def & coefficient	4M	7M
	Explanation of three different mechanisms with suitable graph	3M	
(b)	$L = 500m = 0.5$ km, $P_{out} = 90$ mW	1M	
	$P_{in} = 100$ mW $= 100\times10^{-3}$ W $= 90\times10^{-3}$ W	2M	4M
	$\alpha = ?$		
	$\alpha = \frac{-10}{L}\log_{10}\left(\frac{P_{out}}{P_{in}}\right)$ dB/km $= 0.915$ dB/km	1M	
	(OR)		
(6) (a)	three assumptions of CFET	2M	
	Success of quantum free electron theory	4M	6M
(b)	$E - E_F = 0.02$ eV $= 0.02\times1.6\times10^{-19}$ J	1M	
	$f(E)$ at 200K = ? & at 400K = ?	1M	
	$f(E) = \frac{1}{e^{E-E_F/kT}+1}$ $= 0.24$ at 200K	2M	4M
	$= 0.36$ at 400K		

Staff HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF ..... PHYSICS .....

SCHEME FOR VALUATION

Internal Test ..... II .....

Semester & Section: Ist / A, B Date: 03/03/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
	Part-D		
7 (a)	Explanation of three types of optical fibers with suitable diagrams	1M	
	(1) Single mode fiber	2M	7M
	(2) Step-up index multimode fiber	2M	
	(3) Graded index multimode fiber	2M	
(b)	Given : $n_1 = 1.50$, $n_2 = 1.48$	1M	3M
	To find : $N.A = ?$, $\theta = ?$	1M	
	W.K.T $N.A = \sqrt{n_1^2 - n_2^2} = 0.244$	1M	
	$\theta = \sin^{-1}(N.A) = 14.1^\circ$		
	(OR)		
8	Fermi energy definition, derive expression for electrical conductivity in metals	2M	
		4M	10M
		4M	

Staff HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN | 1 | C | E | | | | | | |

SUB CODE:21PHY12

CITY ENGINEERING COLLEGE
III Internal Test

Sem & Branch: CS/EC/CIV/ME
Sub Name:Engineering Physics
Max Marks: 40

Date:12/04/2022
Time: 10:30-12:00
Duration: 1:30 hr.

Note: Answer all Questions selecting any ONE FULL questions from each part

Q No.	Sub Q No.	Questions	Marks	CO's	BT Level
		PART-A			
1		Give an account of wave function in quantum mechanics. Set up time-independent one dimensional Schrodinger's wave equation.	10	CO2	BT2
		OR			
2	a	Derive the expression for Clasius-Mossotti equation.	6	CO4	BT1
	b	The position and momentum of an electron with energy 1 KeV are determined. If the inherent uncertainty in the measurement of its position is 1 A^0, what is the minimum percentage uncertainty in its momentum.	4	CO2	BT5
		PART-B			
3		Explain wave-particle dualism, de-Broglie hypothesis. Derive the expression for de-Broglie wavelength for an accelerated electron.	10	CO2	BT4
		OR			
4		What is Hall Effect? Obtain an expression for the Hall coefficient and Hall voltage.	10	CO4	BT4

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PART-C

5	a	Deduce wein's law and Rayleigh jeans law from planck's radiation law.	7	CO2	BT2
	b	Estimate the potential difference through which a proton is needed to be accelerated so that its de-Broglie wavelength becomes equal to 1 A^0. given that it's mass is 1.673×10^{-27} kg.	3		BT5

OR

6	a	Derive the relation between Fermi energy and energy gap for an intrinsic semiconductor.	6	CO4	BT2
	b	The electron mobility and hole mobility of silicon are 0.17 m^2/vs and 0.035 and 0.035 m^2/vs respectively at room temperature. If the carrier density is known to be $1.1 \times 10^{16}/m^3$, calculate the resistivity of silicon semiconductor material.	4	CO4	BT5

PART-D

7	a	Explain the types of polarization.	07	CO3	BT2
	B	If a NaCl crystal is subjected to an electric field of 1000 V/m and the resulting Polarization is 4.3×10^{-8} C/m^2. Calculate the dielectric constant of NaCl.	03		BT5

OR

8		Explain Heisenberg's uncertainty principle and prove that free electron does not exist inside the nucleus.	10	CO4	BT

Course outcomes:

Co1: Understand various types of oscillations and their implications, the role of shock waves in various fields

Co2: Compute Eigen values, Eigen functions, the momentum of atomic and subatomic particles using time independent Schrodinger's wave equation.

Co3: Apprehend the basics of laser and optical fiber with different types and applications in various fields.

Co4: Understand electrical conductivity phenomena in solid materials.

Co4: Understand the various measurement techniques.

BT Levels:

BT1-Knowledge , BT2-Understand, BT3- Apply, BT4-Analyzing , BT5-Evaluate, BT6- Creating

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF PHYSICS

SCHEME FOR VALUATION

Internal Test III

Semester & Section: IST / A, B Date: 12/04/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
	Part - A		
(1)	wave function explanation	2M	
	W.K.T $\psi = Ae^{i(kx-\omega t)}$	2M	
	arrive upto $\frac{1}{\lambda^2} = -\frac{1}{4\pi^2\psi}\frac{d^2\psi}{dx^2}$	3M	10M
	arrive upto $\frac{d^2\psi}{dx^2} + \frac{8\pi^2 m}{h^2}(E-V)\psi = 0$	3M	
	(a)		
(2) (a)	Explanation $\mu = \alpha_e E_i$	2M	
	arrive upto $E_i = \frac{P}{N\alpha_e}$	2M	6M
	and $\frac{(\varepsilon_r - 1)}{(\varepsilon_r + 2)} = \frac{N\alpha_e}{3\varepsilon_0}$	2M	
(b)	Given $E = 1\,KeV$		
	$\Delta x = 1\,A^0$	2M	4M
	$\Delta p_x = ?$	2M	
	per uncertainity in $\Delta p_x = ?$		
	$\Delta x \Delta p_x \geq h/4\pi$ $\Delta p_x =$		
	per uncertainity in mom =		

Staff HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF PHYSICS

SCHEME FOR VALUATION

Internal Test III

Semester & Section: 1st & A/B

Date: 12/4/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
	Part-B		
(3)	wave-particle dualism explanation	4M	
	W.K.T $\lambda = \frac{h}{p}$ & $p = mv$	2M	10M
	arrive upto $\lambda = \frac{h}{\sqrt{2meV}}$	2M+2M	
	(OR)		
(4)	Hall effect statement	2M	
	explanation & diagram		
	arrive upto $E_H = BV$	2M	
	and $V = \frac{I}{\rho w d}$	2M	10M
	and $R_H = \frac{1}{\rho}$	2M	
	$V_H = R_H \left(\frac{BI}{w}\right)$	2M	
	part-C		
(5)(a)	planck's radiation law statement & expression	3M	
	arrive at $u_\lambda d\lambda = C_1 \lambda^{-5} e^{-C_2/\lambda T} d\lambda$	2M	7M
	and $u_\nu d\lambda = 8\pi K T \lambda^{-4} d\lambda$	2M	

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF PHYSICS

SCHEME FOR VALUATION

Internal Test III

Semester & Section: 1st & A/B

Date: 12/4/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
5 (b)	Given $\lambda = 10^{-10}$ m $m = 1.673 \times 10^{-27}$ kg $V = ?$ w.k.t $\lambda = \frac{h}{\sqrt{2meV}}$, $V = \frac{h^2}{2me\lambda^2}$ $V = 0.082$ V	1M 2M 1M	3M
6 (a)	w.k.t $N_e = N_h$ and $(m_e^*)^{3/2} e^{(E_F - E_g)/kT} = (m_h)^{3/2} e^{-(E_F/kT)}$ arrive at $E_F = \frac{E_g}{2}$		
(b)	Given $\mu_e = 0.17$ m^2/Vs, $\mu_h = 0.035$ m^2/Vs $n_i = 1.1 \times 10^{16}$ /m^3 $\sigma_i = ?$ w.k.t $n_i = \frac{1}{e\rho_i(\mu_e + \mu_h)} = \frac{\sigma_i}{e(\mu_e + \mu_h)}$ $\sigma_i = n_i e(\mu_e + \mu_h)$ $= 3.6 \times 10^{-4}$ Ωm	1M 1M 1M	3M

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF PHYSICS

SCHEME FOR VALUATION

Internal Test III

Semester & Section: 1st & A & B

Date: 12/4/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
	Part-D		
7 (a)	3 types of polarization diagrams, explanation and expressions	1M 3M 2M	6M
(b)	W.K.T $E = 1000$ V/m, $P = 4.3 \times 10^{-8}$ C/m^2	1M	
	dielectric const. ε_r = ?	1M	
	W.K.T $P = \varepsilon_0(\varepsilon_r - 1)E$	1M	3M
	$\varepsilon_r = 5.855$		
	(OR)		
8 (a)	Heisenberg principle statement	2M	
	explanation and expressions	2M	
	W.K.T $E = \frac{p^2}{2m}$	2M	
	$\Delta p_x \Delta x \geq h/4\pi$, $\Delta x \leq 10^{-14}$ m	2M	10M
	and prove that $E \geq 85$ MeV which is not true	2M	

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Year : 2021 - 2022 Semester : Odd / Even

Name of the Teacher : Dr K. Sujatha, Nagashree G

Designation : HOD & prof., Asst. prof

Department : Physics

	Sem/ Branch	Subject Code	Subject
1.	I Sem	21PHY12	Engineering Physics
2.			
3.			

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff	31/12/21	20/1/22	28/2/22	22/4/22
HOD	Ksujatha	Ksujatha	Ksujatha	JSA
Principal				

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ATTENDANCE

Sl. No.	Reg.No.	Name	24/12	22/12	23/12	24/12	27/12	28/12	29/12	30/12	31/12	3/1	4/1	5/1	6/1	7/1
		Section A (CSE)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	1CE21CS001	A.C. Vimal Gowda	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2																
3	CS005	Ajay	1	1	2	3	4	5	6	7	8	9	10	11	12	13
4	CS006	Akshitha.S	1	2	3	4	5	6	7	8	9	10	11	12	13	14
5	CS007	Amulya V. Murthy	1	2	3	4	5	6	7	8	9	10	11	12	13	14
6	CS009	Ananya Yadav	1	2	3	4	5	6	7	8	9	10	11	12	13	14
7	CS010	Anjaneya.V		1	2	3	4	5	6	7	8	9	10	11	12	13
8	CS011	Ankith		1	2	3	4	5	6	7	8	9	10	11	12	13
9	CS014	Ashwini.C		1	2	3	4	5	6	7	8	9	10	11	12	13
10	CS015	Ashwini.S	1	2	3	4	5	6	7	8	9	10	11	12	13	14
11	CS016	Ayesha Kaleem	1	2	3	4	5	6	7	8	9	10	11	12	13	14
12	CS018	Bhagyavant	1	2	3	4	5	6	7	8	9	10	11	12	13	14
13	CS019	Bharath Kumar.J	1	2	3	4	5	6	7	8	9	10	11	12	13	14
14	CS021	Bharath.S (Sreedevi Amma)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
15		Bhavani.N														
16	CS024	Chandralekha.S	1	2	3	4	5	6	7	8	9	10	11	12	13	14
17	CS027	Chinmayi.L	1	2	3	4	5	6	7	8	9	10	11	12	13	14
18	CS087	Daniel Jayakumar.P	1	2	3	4	5	6	7	8	9	10	11	12	13	14
19	CS028	Darshan	1	2	3	4	5	6	7	8	9	10	11	12	13	14
20	CS031	Darshan.M.Y	1	2	3	4	5	6	7	8	9	10	11	12	13	14
21	CS030	Darshan.M.B	1	2	3	4	5	6	7	8	9	10	11	12	13	14
22	CS032	Darshan.S	1	2	3	4	5	6	7	8	9	10	11	12	13	14
23	CS035	Diksha.P.S	1	2	3	4	5	6	7	8	9	10	11	12	13	14
24	CS036	G.S.Bharathi	1	2	3	4	5	6	7	8	9	10	11	12	13	14
25	CS040	Godha.M	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	No. of Abs.															
	Initials															

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ATTENDANCE

Sl. No.	Reg.No.	Name	21/12	22/12	23/12	24/12	27/12	28/12	29/12	30/12	31/1	3/1	4/1	5/1	6/1	7/1
			1	2	3	4	5	6	7	8	9	10	11	12	13	14
26	CS041	Harisha . C	1	2	3	4	5	6	7	8	9	10	11	12	13	14
27	CS043	Harshitha . G . M	1	2	3	4	5	6	7	8	9	10	11	12	13	14
28	CS047	Harshitha . N	1	2	3	4	5	6	7	8	9	10	11	12	13	14
29	CS050	Hrithik . M	1	2	3	4	5	6	7	8	9	10	11	12	13	14
30	CS051	Hussain Mubarak	1	2	3	4	5	6	7	8	9	10	11	12	13	14
31	CS055	Jayanth . N	1	2	3	4	5	6	7	8	9	10	11	12	13	14
32		~~Jeevan Kumar~~														
33	CS057	Keertana . Shendre	1	2	3	4	5	6	7	8	9	10	11	12	13	14
34	CS062	Kommiredala Premkumar	1	2	3	4	5	6	7	8	9	10	11	12	13	14
35	CS063	Krathik . B . R	1	2	3	4	5	6	7	8	9	10	11	12	13	14
36	CS064	M . Harshitha	1	2	3	4	5	6	7	8	9	10	11	12	13	14
37	CS065	M . Naresh	1	2	3	4	5	6	7	8	9	10	11	12	13	14
38	CS071	Mohammed Arkham	1	2	3	4	5	6	7	8	9	10	11	12	13	14
39	CS074	Mohammed Grouse Ismail S H	1	2	3	4	5	6	7	8	9	10	11	12	13	14
40	CS075	Mohammed Jalaluddin	1	2	3	4	5	6	7	8	9	10	11	12	13	14
41	CS081	Muskan Sharif	1	2	3	4	5	6	7	8	9	10	11	12	13	14
42	CS082	Navya . D	1	2	3	4	5	6	7	8	9	10	11	12	13	14
43	CS083	Neha . Y	1	2	3	4	5	6	7	8	9	10	11	12	13	14
44	CS085	Nithin . P	1	2	3	4	5	6	7	8	9	10	11	12	13	14
45	CS092	Pratham . S	1	2	3	4	5	6	7	8	9	10	11	12	13	14
46	CS094	Preethi . V	1	2	3	4	5	6	7	8	9	10	11	12	13	14
47	CS095	Priyanka . J	1	2	3	4	5	6	7	8	9	10	11	12	13	14
48	CS096	Priyanka . M	1	2	3	4	5	6	7	8	9	10	11	12	13	14
49	CS097	Punith . P	1	2	3	4	5	6	7	8	9	10	11	12	13	14
50	CS099	Rakesh . M	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	No. of Abs.															
	Initials															

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ATTENDANCE

Sl. No.	Reg.No.	Name	21/12	22/12	23/12	24/12	27/12	28/12	29/12	30/12	31/12	3/1	4/1	5/1	6/1	7/1
			1	2	3	4	5	6	7	8	9	10	11	12	13	14
51		Roushan Kumar														
52	CS102	Resanya. K.M	1	1	2	3	4	5	6	7	8	9	10	11	12	13
53	CS103	Richen Swagamica	1	2	3	4	5	6	7	8	9	10	11	12	13	14
54	CS105	Rupini. C	1	2	2	3	4	5	6	7	8	9	10	11	12	13
55	CS107	S. Abhishek	1	2	3	4	5	6	7	8	9	10	11	12	13	14
56	CS109	Sachin. B.S	1	2	3	4	5	6	7	8	9	10	11	12	13	14
57	CS111	Sandhya. M	1	2	3	4	5	6	7	8	9	10	11	12	13	14
58	CS115	Shambavi. S	1	2	3	4	5	6	7	8	9	10	11	12	13	14
59	CS138	Teja. T	1	2	3	4	5	6	7	8	9	10	11	12	13	14
60	CS146	Vishnu Chandra. N.L	1	2	3	4	5	6	7	8	9	10	11	12	13	14
61																
62																
63																
64																
65																
66																
67																
68																
69																
70																
71																
72																
73																
74																
75																
		No. of Abs.														
		Initials														

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

(Doddakallsandra, Off Kanakapura Road, Bangalore-560061)

Department of Chemistry

Faculty Academic File

NAME: Dr. Sunitha N

DESIGNATION: Associate Professor

SEMESTER: I

SECTION: C, D

SUBJECT NAME & CODE: Engg. Chemistry

ACADEMIC YEAR: 2021-22

ATTESTED COPY.

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE
DEPARTMENT OF .....Chemistry.....

CONTENTS

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

VISION

Making Remarkable Contribution by Disseminating Knowledge on Emerging Trends in Engineering and Technology through various Programmes, Innovation and Research so as to Excel in Quality both at National and International level and to provide Career Guidance & Training for Employment.

MISSION

M1- To encourage Knowledge Acquisition and Foster Innovation & Research.

M2- To Prepare Students for Immediate Employment, leading to Technological and Socio- economical growth.

M3- To Provide Guidance for a Productive Career under various programmes.

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

PROGRAM OUTCOMES (PO)

PO1 – Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 – Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 – Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 – Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 – Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6 – The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7 – Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8 – Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9 – Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 – Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 – Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12 – Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

DEPARTMENT OF CHEMISTRY

VISION

- To convey knowledge on engineering chemistry to stakeholders for engineering applications.

MISSION

- Facilitate the faculty to strengthen their knowledge and skills using ICT tools.
- Motivate and train students in theory and laboratory practices.
- Succeed to deal with societal issues like preserving green environment.

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF BASIC SCIENCE

CIRCULAR

Ref No: CEC/BS/DAC/ACY 2021-22/OR/01 Date: 05-12-2021

This is to inform the members of Department Advisory Committee that meeting is scheduled on 14-12-2021 at 10: 00 AM in Physics Laboratory.

Agenda:

- Commencement of classes for 1st semester students
- Phase I Student Induction Programme for 1st semester students
- Conduction of Talents day
- Organizing value added courses/ certificate courses in the curriculum

Convener
Dr. Rajasekhar. P

HOD
Dr. Sujatha .K

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF BASIC SCIENCE

Department Advisory Committee Meeting

Date: 14-12-2021 & 15-12-2021
Time: 10:00 AM
Venue: Physics Laboratory

DAC Members Present:

Sl. No	Member Name	Designation	Role	Signature
1	Dr. P. Rajshekar	HOD & Professor	Convener	
2	Dr. Sunitha. N	Assistant Professor	Member	
3	Mrs. Anu Radha U	Assistant Professor	Member	
4	Mrs. Sowmya P	Assistant Professor	Member	Sowmya.
5	Dr. Sujatha	HOD & Professor	Member	
6	Mrs. Nagashree. G	Assistant Professor	Member	
7	Mrs. Ashwini Hindiholi	Assistant Professor	Member	
8	Dr. Jyothi. P	Associate Professor	Member	
9	Vanitha G R	Assistant Professor	Member	
10	Mrs. Gayatri annasagaram	Assistant Professor	Member	
11	Mrs. Kalavathi	Assistant Professor	Member	
12	Mrs. Gana Priya	Assistant Professor	Member	
13	Mrs. Reena Patro	Assistant Professor	Member	
14	Ms. Suvitha. N	Manager, CTS	Employer (Industry Expert)	
15	Mrs. Spoorthy S P Jain (Alumni)	Project Manager, TCS	Employer (Subject Expert)	

Agenda of the Meeting:

- Inauguration programme for 1st semester students on 21st December 2021.
- Commencement of orientation Programme from 22nd December 2021.
- Conduction of Talents day on 27th December 2021.
- Classes for 1st semester students will be from 4th January 2022.
- Organizing value added courses/ certificate courses in the curriculum like Entrepreneurship and innovation.
- Organizing seminars and webinars.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

Minutes of Meeting:

The members discussed suggestions for improvement and reviewed the meeting agenda.

- The committee decided to organize value added course on Entrepreneurship and innovation.
- It was discussed to conduct Talents day on 27th December 2021.
- Committee decided to conduct webinar on Introduction to Research Methodology.
- Committee members agreed in conducting a seminar on career guidance --Navigating Your Future.

Convener
Dr. Rajasekhar. P

HOD
Dr. Sujatha .K

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE, BENGALURU-560061.
DEPARTMENT OF APPLIED SCIENCE AND HUMANITIES ACADEMIC CALENDAR 2021-22 (ODD SEM)

DAY	Date	OCTOBER	Dat	NOVEMBER	Date	DECEMBER	Date	JANUARY	Date	FEBRUARY	Date	MARCH
FRI	1	STARTING OF 5th& 7th Semesters										
SAT	2	GANDHI					1					
SUN	3						2					
MON	4		1	KANNADA RAJYOTSAVA(DH)			3					
TUE	5		2				4	START OF 1ST SEM	1	PRACTICAL EXAMS 5TH& 7TH SEMESTERS	1	
WED	6	MAHALAYA AMAVASYA(DH)	3	NARAKA CHATURDASHI(DH)	1		5		2		2	
THU	7		4		2		6		3		3	
FRI	8		5	DEEPAVALI(DH)	3		7		4		4	
SAT	9	2ND SAT HOLIDAY	6		4		8	2ND SAT	5		5	
SUN	10		7		5		9		6		6	
MON	11		8		6	SECOND INTERNAL 5th&7th Semesters	10		7		7	
TUE	12		9	FIRST INTERNAL 5th& 7th Semesters	7		11		8		8	
WED	13		10		8		12		9		9	
THU	14	AYUDHA PUJA(DH)	11		9		13		10		10	
FRI	15	VIJAYA DASHAMI(DH)	12		10		14		11		11	
SAT	16		13	2ND SAT HOLIDAY	11	2ND SAT HOLIDAY	15		12	2ND SAT HOLIDAY	12	2ND SAT HOLIDAY
SUN	17		14		12		16		13		13	
MON	18	STARTING OF 3rd Semester	15		13	STARTING OF1st Semester	17		14		14	
TUE	19	ID MILAD(DH)	16		14	MOM ON CURRICULUM	18		15		15	
WED	20	VALMIKI JAYANTHI(DH)	17		15	MOM ON CURRICULUM ENRICHMENT	19		16		16	
THU	21		18		16		20		17	SECOND INTERNALS – 3RD SEM	17	THIRD INTERNAL – 3RD SEM
FRI	22		19		17		21		18		18	
SAT	23	4TH SATURDAY HOLIDAY	20	ALUMNI MEET & GRADUATION DAY	18		22	4TH SATURDAY HOLIDAY	19		19	
SUN	24		21		19		23		20		20	
MON	25		22	KANAKA JAYANTHI(DH)	20		24	FIRST INTERNALS – 1ST SEM	21	SECOND INTERNALS – 1ST SEM	21	THIRD INTERNALS – 1ST SEM
TUE	26		23		21	INAUGURATION DAY	25		22		22	
WED	27		24		22	ORIENTATION DAY	26		23		23	
THU	28		25		23		27		24		24	
FRI	29		26		24		28		25		25	
SAT	30		27	4TH SATURDAY HOLIDAY	25	4TH SATURDAY HOLIDAY	29				26	
SUN	31		28		26		30		27		27	
MON			29	FIRST INTERNAL - 3rd Sem	27	TALENTS DAY	31	LWD of 5th& 7th Sem	28		28	Last Working Day of 1st Semester30.03.2022

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

CITY ENGINEERING COLLEGE
TIME TABLE –FIRST SEMESTER DECEMBER – 2021-22
CHEMISTRY CYCLE

SECTION:C **ROOM NO: A005**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON	EME	PSP	BREAK	MAT	ELN	LUNCH	←------CHEL/CPL/EGHL/C1/C2/C3----→		
TUE	ELN	←CHEL/CPL		EGHL/C2/C3/C1----→			CHE	MAT	
WED	CHE	PSP		ELN	EME		IDT	EGH	LIBRARY
THU	PSP	EME		MAT	CHE		←-------CHEL/CPL/EGHL/C3/C1/C2----→		
FRI	MAT	ELN		PSP(T)	CHE		EDUSAT/DEP/COLLEGE ACVIVITIES/LIBARARY		
SAT	PSP	ELN(T)		EME	EGH				

MAT- Dr. Jyothi.P & Prof. Gayathri A
PSP - Prof. Rakesh
IDT-Ms. Shwethashree
CHEL - Dr. Rajasekhar.P & Dr. Sunitha.N
EGH, EGHL- NEW STAFF

CHE - Dr.Rajasekhar.P & Dr.Sunitha.N
ELN-Prof. Ravindra.S
EME Prof. Raghu C & Prof. Harshavardhan
CPL- Prof.Rakesh & Prof. Ramesh B

PROCTORS - Prof. Ravindra.S & Prof. Raghu

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

HOD

PRINCIPAL

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE
TIME TABLE –FIRST SEMESTER DECEMBER – 2021-22
CHEMISTRY CYCLE

SECTION:D

ROOM NO: A004

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON	CHE	EME	BREAK	MAT	PSP	LUNCH	ELN	IDT	EME(T)
TUE	MAT	CHE		PSP	ELN(T)		←-------CHEL/CPL/EGHL/D1/D2/D3----→		
WED	ELN	EME		MAT	CHE		←-------CHEL/CPL/EGHL /D2/D3/D1----→		
THU	ELN	←------CHEL/		/CPL/EGHL /D3/D1/D2---------→			PSP	EGH	EGH
FRI	PSP	MAT		CHE	EME		EDUSAT/DEP/COLLEGE ACVIVITIES/LIBARARY		
SAT	EME	ELN		PSP(T)	LIBRARY				

MAT- Dr. Jyothi.P & Prof. Gayathri A
PSP - Prof. Rakesh
IDT-Ms. Shwethashree
CHEL - Dr. Rajasekhar.P & Dr. Sunitha.N
EGH, EGHL- NEW STAFF

CHE - Dr.Rajasekhar.P & Dr.Sunitha.N
ELN-Prof. Gopi Kishan
EME Prof. Raghu C & Prof. Harshavardhan
CPL- Prof.Rakesh & Prof. Ramesh B

PROCTORS - Dr.Sunitha.N & Prof. Rakesh

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

HOD

PRINCIPAL

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE
TIME TABLE –FIRST SEMESTER DECEMBER – 2021-22
CHEMISTRY CYCLE

Dr. Sunitha. N (SN)

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON						LUNCH	←----------C1 lab----------→ SN+ANU+PRS		
TUE		D					←----------D1 lab----------→ SN+SWM		
WED	C						←----------D2 lab----------→ SN+ANU		
THU				C			←----------C3 lab----------→ SN+SWM		
FRI				D					
SAT									

HOD

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

BRANCH: Computer Science & Engineering

Room No.: A005 'C' Section _Chemistry Cycle

Sl. No.	USN/ Branch	Name	Category	Batch 3/01/22	5/1
1	CSE	ABHISHEK MG	CET		
2	CSE	ADITYA R RAGATE	MGQ		
3	CSE	ANAND	CET		
4	CSE	ANKUSH KUMAR	CET		
5	CSE	ASHISH S D	CET		
6	CSE	BEERESH N	CET		
7	CSE	BHARATH REDDY G	CET		
8	CSE	BHARATH S	CET		
9	CSE	CHANDRASHEKAR M R	MGQ	C1	
10	CSE	CHETHAN H S	CET		
11	CSE	DARSHAN K M	CET		
12	CSE	DEEPAK K	CET		
13	CSE	DHANUSH R	CET		
14	CSE	GANESH METI	CET		
15	CSE	GANGOTHRI V	CET		
16	CSE	HARSHA VARDHAN S M	CET		
17	CSE	HARSHITHA JK	CET		
18	CSE	HARSHITHA M	CET		
19	CSE	HARSHITHA N	CET		
20	CSE	HARSHITHA S P	CET		
21	CSE	HASTAATH KHAN	MGQ		
22	CSE	INCHARA S	CET		
23	CSE	JAISHANKAR REDDY V	CET		
24	CSE	JUNAID ULHAQ V I	MGQ		
25	CSE	KAVYASHREE V	CET		
26	CSE	KEERTHANA S	CET		
27	CSE	KEERTHANA U	CET	C2	
28	CSE	KIRAN M	CET		
29	CSE	KISHAN A	CET		
30	CSE	MEGHANA M S	CET		
31	CSE	MEGHANA N	CET		
32	CSE	MIKIHISHA KARIBE	MGQ		
33	CSE	MOHAMMAD JAFAR	CET		
34	CSE	MOHAMMED DAWOOD	CET		
35	CSE	MOHAMMED SAFWAAN SHARIFF A	CET		
36	CSE	MOHAN KRISHNA D	MGQ		

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

37	CSE	MONICA R	CET	C3	
38	CSE	NISARGA M U	CET		
39	CSE	NIVEDITHA R D	CET		
40	CSE	P SHAMANTH	CET		
41	CSE	PRAJNA DATTATRAYA NAIK	CET		
42	CSE	PREETHI P N	CET		
43	CSE	RATNESH	CET		
44	CSE	RIMAH MANAL	CET		
45	CSE	RUPLA S JADAV	CET		
46	CSE	S NAINA SHALLET	CET		
47	CSE	SAIF ALI BADAL	CET		
48	CSE	SANNIDHI N D	CET		
49	CSE	SATISH C	CET		
50	CSE	SHARATH SURGIMATH	CET		
51	CSE	SHASHANK RAO L	MGQ		
52	CSE	SHASHANK T S	CET		
53	CSE	SHILPA S	CET		
54		Shubha. M	MG.		

Signature of HOD

Signature of Principal

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

BRANCH: Computer Science & Engineering

Room No.: A004 'D' Section _Chemistry Cycle

Sl. No.	USN/ Branch	Name	Category	Batch 4/1/22	
1	CSE	SHREE VISHNU POOJARI	CET		
2	CSE	SHREELAKSHMI R	CET		
3	CSE	SHUBHA H	MGQ		
4	CSE	SINCHANA K P	MGQ		
5	CSE	SRINATHA V	CET		
6	CSE	SRUSHTI PRAKASH KODABAL	CET		
7	CSE	SUHAS SHENOY	MGQ		
8	CSE	SUMANTH J M	CET		
9	CSE	SUNIL J S	CET		
10	CSE	SURYA R	MGQ	D1	
11	CSE	SWATHI V	CET		
12	CSE	T K THARUN	CET		
13	CSE	VAISHNAVI S SALIAN	CET		
14	CSE	VINOD KUMAR B C	CET		
15	CSE	VISHWAJIT VENKATRAMAN BHAT	CET		
16	AI&ML	AKSHATHA S R	CET		
17	AI&ML	DARSHAN T S	CET		
18	AI&ML	DIVYA M	CET		
19	AI&ML	NAMAN BAFNA	CET		
20	AI&ML	S YASHASWI	CET		
21	AI&ML	SHAMANTH M S	CET		
22	AI&ML	SYED INSAF MEHDI	CET		
23	AI&ML	THARUN KUMAR R N	CET		
24	E&C	AAKAANKSHA S KUMMUR	CET		
25	E&C	AHMADI ALMAS KHANUM	CET-SNQ		
26	E&C	ATHIRA GUPTA R	CET		
27	E&C	DARSHAN PAUL B	CET		
28	E&C	HARSHITH C GOWDA	CET	D2	
29	E&C	KENCHAPPA Y R	CET		
30	E&C	NAGARAJ	CET		
31	E&C	SANJANA C K	CET		
32	ISE	AKASH KUMAR	CET		
33	ISE	DARSHAN M	CET		
34	ISE	KANAKALAKSHMI	CET		
35	ISE	KARANA U	MGQ		
36	ISE	PUNITH KUMAR M S	MGQ		

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

37	ISE	RAMAPURAM CHETHAN	MGQ	D3	
38	ISE	SAFRIN FATHIMA	CET		
39	ISE	SATHISH V	CET		
40	ISE	SHIVAKUMAR N	CET		
41	CSE	YATHISH R	MGQ		
42		Darshan.	CET		
43		Sindhu S	CET		
44		Lakshitha. R	MG.		
45		Darshini. R	CET		
46		Spoorthi B	MG.		
47		Harshith. N	CET		
48		Meghana. M.S	CET		
49		Preethi P.N	CET		
50					
51					
52					
53					
54					

Signature of HOD **Signature of Principal**

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

I/II Semester

ENGINEERING CHEMISTRY			
Course Code	**21CHE12/22**	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	2:2:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	3Hour

Course Objectives: The course will enable the students to

CLO1: Impart the basic knowledge of chemistry and its principles involved in electrochemistry, energy storage devices and its commercial applications.

CLO2: Understand the basic principles of corrosion and its prevention, metal finishing and its technological importance

CLO3: Master the knowledge of synthesis, properties and utilization of engineering materials like polymers & Nano materials.

CLO4: Apply the knowledge of Green Chemistry principles for production of chemical compounds. understanding the concepts of alternative energy sources.

CLO5: Understand the basic concepts of water chemistry & theory, basic principle and applications of volumetric analysis and analytical instruments.

Pedagogy (General Instructions):

These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes.

1. Lecturer method (L) does not mean only traditional lecture method, but different type of teaching methods may be adopted to develop the outcomes.
2. Show Video/animation films to explain methods of synthesis of nanomaterials.
4. Encourage collaborative (Group Learning) Learning in the class
5. Ask at least three HOTS (Higher order Thinking) questions in the class, which promotes critical thinking
6. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyse information rather than simply recall it.
7. Topics will be introduced in a multiple representation.
8. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
9. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.

Module-1

Electrochemistry and energy storage systems:

Electrochemistry: Introduction, EMF of cell, Free Energy, Single electrode potential-Derivation of Nernst equation, Numerical problems based on Nernst Equation (E, E^o & Ecell).

Reference Electrodes: Introduction, construction, working and applications of calomel electrode, ion selective electrodes: Introduction, construction, working and applications of Glass electrode, determination of pH using Glass electrode.

Energy storage Systems: Introduction, Classification of batteries (primary, secondary and reserved batteries). Construction, working and applications of Li-ion batteries. Advantages of Li-ion battery as

an electrochemical energy system for electric vehicles. Recycling of Lithium-ion batteries by direct cycling Method. Brief introduction of Na- ion battery.	
Teaching Learning Process	Electrochemistry and energy systems-chalk and talk method, power point presentation. Practical topic: Determination of pKa value of weak acid using glass electrode. Energy storage Systems-Power point presentation, youTube videos for Li-ion battery construction and working. Self-study material: Construction and working of classical batteries like Zn-MnO_2 and Pb-PbO_2 batteries

Module-2

Corrosion and Metal finishing:

Corrosion and it's control:

Introduction, Electrochemical theory of corrosion, Factors affecting the rate of corrosion: ratio of anodic to cathodic areas, nature of corrosion product, nature of medium – pH, conductivity and temperature. Types of corrosion - Differential metal and differential aeration (pitting and water line). Corrosion control: Anodizing – Anodizing of aluminum, Cathodic protection - sacrificial anode and impressed current methods, Metal coatings – Galvanization. Corrosion Penetration Rate (CPR), numerical problems on CPR.

Metal finishing: Introduction, technological importance. Electroplating: Introduction, Electroplating of chromium (hard and decorative). Electroless plating: Introduction, distinction between electroplating and electroless plating processes. Electroless plating of copper.

Teaching Learning Process	Chalk and talk method and power point presentation - Electrochemical theory of corrosion, Factors affecting the rate of corrosion, Types of corrosion and corrosion control. Technological importance. Electroplating: Introduction, principle governing electroplating, polarization, decomposition potential and over voltage. Videos: Electroplating of chromium, electroless plating of Nickel and copper Self-learning material: Organic coatings: Paint, components of paints and their functions. Varnish, definition, differences between paints varnishes.

Module-3

Engineering Materials

Polymers: Introduction, Synthesis and applications of Polyurethanes. Polymer composites- Introduction, synthesis, properties & applications of Kevlar Fibre,

Conducting Polymers: Introduction, Synthesis & Mechanism of conduction in polyaniline and factors influencing conductivity of organic polymers.

Biodegradable polymers: Introduction and their requirements. Synthesis, properties and applications of Poly lactic acid.

Nanomaterials:

Introduction, size dependent properties (Surface area, Electrical, Optical and Catalytic properties). Synthesis of nanomaterials: Top down and bottom-up approaches, Synthesis by Sol-gel, and precipitation method, Nanoscale materials: Fullerenes, Carbon nanotubes and graphenes –brief Explanation, properties and applications.

Teaching Learning Process	Chalk and talk method & Power point presentation - Polymers, Conducting Polymers, Biodegradable polymers, nanomaterials Practical topics: Synthesis of nanomaterials by precipitation method Self-learning material: Classification of polymers, nanomaterial synthesis by chemical vapor deposition.

Module-4

Green Chemistry and Alternative energy resources

Green Chemistry: Introduction, definition, Major environmental pollutants - Oxides Nitrogen, Sulphur and Carbon (Mansion the impact of these pollutants on environment), Basic principles of green chemistry -brief discussion on 12 principles of green chemistry.

Various green chemical approaches – Microwave synthesis, Bio catalysed reaction (only explanation with examples),

Solvent-free reactions- advantages and conditions

Synthesis of typical organic compounds by conventional and green route;

i) Adipic acid – Conventional synthesis from Benzene, Green synthesis from glucose.

ii) Paracetamol- Conventional and Green synthesis from Phenol

Industrial applications of Green Chemistry

Green fuel: Hydrogen-production (Photo electrocatalytic and photo catalytic water splitting) and applications in hydrogen fuel cells. Construction, working and applications of Methanol-Oxygen fuel cell (H_2SO_4 as electrolyte).

Solar Energy:

Introduction, construction, working and applications of photovoltaic cell.

Teaching Learning process	Chalk and talk/power point presentation - Basic principles of green chemistry Videos: Various green chemical approaches, Self-study material: Atom economy-synthesis of ethylene oxide and methyl methacrylate. Advantages & disadvantages of photovoltaic cell.

Module-5

Water Chemistry, chemical analysis and Instrumental methods of analysis

Water chemistry:

Introduction, sources and impurities in water, Potable water; meaning and specifications (as per WHO standards), Hardness of water, types, determination of hardness using EDTA titration, numerical problems on hardness of water. Definition of Biological oxygen demand (BOD) and Chemical Oxygen Demand (COD), determination of COD of waste water sample and Numerical problems on COD.

Methods of Chemical Analysis:

Volumetric Analysis: Introduction, principles of titrimetric analysis, requirement of titrimetric analysis, primary and secondary standards. Requirement of a primary standard solution, units of standard solutions- Definition of normality, molarity, molality, mole fraction, ppm.

Instrumental methods of analysis:

Introduction, Theory, Instrumentation and applications of Colorimetry, Flame Photometry, Potentiometry, Conductometry (Strong acid with strong base, weak acid with a strong base, mixture of strong acid and a weak acid with a strong base)

Teaching	Chalk and talk/power point presentation – principles of titrimetric analysis, requirement of titrimetric analysis, Classification of titrimetric analysis, Ostwald's theory of acid-base

Learning process	indicator taking phenolphthalein and methyl orange as examples. Instrumental methods of analysis. Practical topic: Volumetric titrations, instrumental methods. Self-study material- Types of volumetric titrations (Neutralization, redox and complexometric),

Course outcome (Course Skill Set)

At the end of the course the student will be able to:

CO1: Discuss the electrochemical energy systems such as electrodes and batteries.

CO2: Explain the fundamental concepts of corrosion, its control and surface modification methods namely electroplating and electroless plating

CO3: Enumerate the importance, synthesis and applications of polymers. Understand properties and application of nanomaterials.

CO4: Describe the principles of green chemistry, understand properties and application alternative fuels.

CO5: Illustrate the fundamental principles of water chemistry, applications of volumetric and analytical instrumentation.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50)in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Continuous Internal Evaluation:

Three Unit Tests each of **20 Marks (duration 01 hour**)

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 15th week of the semester

Two assignments each of **10 Marks**

4. First assignment at the end of 4th week of the semester
5. Second assignment at the end of 9th week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks** (**duration 01 hours**)

6. At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours)**

1. The question paper will have ten questions. Each question is set for 20 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

The students have to answer 5 full questions, selecting one full question from each module.

Suggested Learning Resources:

Books

1. Uppal M.M, Jain and Jain. Engineering Chemistry, Khanna Publishers, 35th Edition, 2013.
2. P.C. Jain and Monica Jain, A test Book of Engineering Chemistry, Dhanpat Rai Publications, New Delhi, 12th Edition, 2012.
3. SS Dara & Dr. SS Umare. -A Text book of Engineering Chemistry, S Chand & Company Ltd., 12th Edition, 2011.
4. R.V. Gadag and Nitthyananda Shetty-A Text Book of Engineering Chemistry, I.K. International Publishing house. 2nd Edition, 2016.

5. B.S. Jai Prakash, R. Venugopal, Sivakumaraiah& Pushpa Iyengar.,- Chemistry for Engineering Students", Subash Publications, Bangalore.5th Edition, 2014
6. F.W. Billmeyer, Text Book of Polymer Science, John Wiley & Sons, 4th Edition, 1999.
7. M.G. Fontana, N.D. Greene, Corrosion Engineering, McGraw Hill Publications, New York, 3rd Edition, 1996.
8. Principles of Physical Chemistry , B.R. Puri, L.R. Sharma & M.S. Pathania, S. Nagin Chand & Co., 41 Edition, 2004.
9. G.A. Ozin & A.C. Arsenault, "Nanotechnology A Chemical Approach to Nanomaterials". RSC Publishing, 2005.

Web links and Video Lectures (e-Resources):

- https://www.youtube.com/watch?v=faESCxAWR9k
- https://www.youtube.com/watch?v=TBqXMWaxZYM&list=PLyhmwFtznRhuz8L1bb3X-9IbHrDMjHWWh
- https://www.youtube.com/watch?v=j5Hml6KN4TI
- https://www.youtube.com/watch?v=X9GHBdyYcyo
- https://www.youtube.com/watch?v=1xWBPZnEJk8
- https://www.youtube.com/watch?v=wRAo-M8xBHM.

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- https://www.vlab.co.in/broad-area-chemical-sciences
- https://demonstrations.wolfram.com/topics.php
- https://interestingengineering.com/science

HOD

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF CHEMISTRY

LESSON PLAN FOR ODD SEMESTER FOR ACADEMIC YEAR 2021-2022

Course Title: **Engineering Chemistry**	Course Code : 21CHE12/22
Total contact hours: L:T:P:S :: 2:2:0	SEE Marks : 50
Internal Marks : 50	
Semester : I/II	Academic year : 2021-2022
Lesson plan Author: Dr. P. Rajasekhar & Dr. Sunitha. N	Date : 21/1/2022

Course Objective:

This course (**21CHE12/22**) will enable students to

1. CLO1: Impart the basic knowledge of chemistry and its principles involved in electrochemistry, energy storage devices, and its commercial applications.
2. CLO2: Understand the basic principles of corrosion and its prevention, metal finishing, and its technological importance
3. CLO3: Master the knowledge of synthesis, properties, and utilization of engineering materials like polymer, lubricants, and refractories.
4. CLO4: Apply the knowledge of Green Chemistry principles for the production of chemical compounds. Understanding the concepts of synthesis and characterization of nanomaterials.
5. CLO5: Understand the theory, basic principle, and applications of volumetric analysis and analytical instruments.

Teaching-Learning Process (General Instructions):

These are sample Strategies: which teachers can use to accelerate the attainment of the various course outcomes.

1. Lecturer method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain methods of synthesis of nanomaterials.
3. Encourage collaborative (Group Learning) Learning in the class
4. Ask at least three HOTS (Higher-order Thinking) questions in the class, which promotes critical thinking
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.

Week	Days/ Date	Contents of Module -1	Bloom's Taxonomy Level	Course Outcome (CO)
1	1	Electrochemistry: Introduction, EMF of cell, freeenergy, single electrode potential, derivation of Nernst equation.	L3	CO1

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

	3	Reference electrodes: Introduction, construction, working and applications of Calomel electrode.	R,U	CO1
	4	Ion-selective electrode – Definition, construction and principle of Glass electrode, and determination of pH using glass electrode.	R,U,E,C	CO1
2	1	**Energy storage systems:** Introduction, classification - primary, secondary and reserve batteries.	R,U	CO1
	2	Construction, working and applications of Li-ion batteries.	R,U	CO1
	3	Advantages of Li-ion battery, recycling of Li-ion batteries.	R,U	CO1

		Contents of Module-2		
4	1	**Corrosion** Introduction, Electrochemical theory of corrosion	R,U	CO2
	2	Factors affecting the rate of corrosion ratio of anodic to cathodic areas, nature of metal, nature of corrosion product, nature of medium – pH, conductivity and temperature.	R,U	CO2
	3	Types of corrosion - Differential metal and Differential aeration - pitting and water line)	R,U	CO2
	4	Corrosion control: Anodizing – Anodizing of aluminium, Cathodic protection	R,U	CO2
5	1	Sacrificial anode and impressed current methods, Metal coatings – Galvanization, tinning.	R,U	CO2
	2	**Metal finishing:** Introduction, Technological importance. Electroplating: Introduction, principles governing electroplating- Polarization	R,U	CO2
	3	decomposition potential and overvoltage	R,U	CO2
	4	Electroplating of chromium (hard and decorative).	R,U	CO2
6	1	Electroless plating of copper	R,U	CO2
	2	Distinction between electroplating and electroless plating processes.	R,U	CO2
	3	**Contents of Module-3** Cement- types of cement, constituents, hardening & setting, deterioration of cement.	R,U	CO3
	4	Polymers Synthesis and application of polyurethanes, Kevlar fibre.	R,U	CO3
	5	Conducting polymers- synthesis, mechanism of conduction in polyaniline, synthesis, properties	R,U	CO3

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

		and applications of poly lactic acid.		
7	1	Nano Materials: Introduction, size dependent properties (Surface area, Electrical, Optical, Catalytic and Thermal properties)	R,U	CO3
	2	Synthesis of nano materials by Sol-gel	R,U	CO3
	3	Synthesis of nano materials by precipitation, chemical vapor deposition	R,U,E	CO3
	4	Nanoscale materials: Fullerenes, carbon nano tubes, grapheme.	R,U	CO3
8	1	**Contents of Module-4** Green Chemistry: Environmental pollutants, principles of green chemistry, microwave synthesis	R,U	CO4
	2	Bio catalysed reations, phase transfer catalysis, super critical conditions for solvent free reactions	R,U	CO4
	3	Synthesis of organic compounds i) adipic acid ii) paracetamol	R,U	CO4
	4	Atom economy – synthesis of ethylene oxide and methyl nethacrylate,	R,U	CO4
	1	Problems on atom economy	R,U,C	CO4
9	2	Construction, working & applications of methanol-oxygen fuel cell with H_2SO_4 electrolyte	R,U, A1	CO4
	3	Hydrogen production (Photo electro catalytic and photo catalytic water splitting)	R,U	CO4
	4	Applications in hydrogen fuel cells	R,U	CO4
	5	**Solar Energy**: Photovoltaic cells-introduction, construction and working of a typical PV cell	R,U	CO4

		Contents of Module-5		
10	1	**Water Chemistry:** Potable water, hardness of water, determination of hardness using EDTA, Problems on hardness of water	R,U,	CO5
	2	Definitions of Biological oxygen demand (BOD) and Chemical Oxygen Demand (COD), determination of COD	R,U	CO5
	3	Numerical problems on COD	R,U	CO5
	4	Volumetric analysis: Principles of titrimetric analysis, Requirement of primary standard solution	R,U	CO5
11	1	Units of standard solutions (N, m, M, mole fraction, ppm)	R,U	CO5

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

	2	Definitions of Equivalent weight, acidity, basicity, primary and secondary standards.	R,U	CO5
	3	Instrumental method of analysis: colorimetry	R,U	CO5
	4	Flame photometry	R,U	CO5
12	1	Atom absorption spectroscopy	R,U	CO5
	2	potentiometry	R,U	CO5
	3	Fluorides (colorimetry).	R,U	CO5
	4	Conductometry SA with SB, WA with SB, Mixture of SA and WA with SB	R,U	CO5

Bloom's Taxonomy Level

R-Remembering U-Understanding A1-Applying A2-Analysing E-Evaluating C-Creating

Text Books:

1.Uppal M.M, Jain and Jain. Engineering Chemistry, Khanna Publishers, 35th Edition, 2013.
2. P.C. Jain and Monica Jain, A test Book of Engineering Chemistry, Dhanpat Rai Publications, New Delhi, 12th Edition, 2012.
3. SS Dara & Dr. SS Umare. -A Text book of Engineering Chemistry, S Chand & Company Ltd., 12th Edition, 2011.
4. R.V. Gadag and Nithyananda Shetty-A Text Book of Engineering Chemistry, I.K. International Publishing house, 2nd Edition, 2016.
5. B.S. Jai Prakash, R. Venugopal, Sivakumaraiah& Pushpa Iyengar..- Chemistry for Engineering Students", Subash Publications, Bangalore.5th Edition, 2014
6. F.W. Billmeyer, Text Book of Polymer Science, John Wiley & Sons, 4th Edition, 1999.
7. M.G. Fontana, N.D. Greene, Corrosion Engineering, McGraw Hill Publications, New York, 3rd Edition, 1996.
8. Principles of Physical Chemistry, B.R. Puri, L.R. Sharma & M.S. Pathania, S. Nagin Chand & Co., 41 Edition, 2004.
9. G.A. Ozin & A.C. Arsenault, "Nanotechnology A Chemical Approach to Nanomaterials", RSC Publishing, 2005.

Weblinks and Video Lectures (e-Resources):

https://www.youtube.com/watch?v=faESCxAWR9k

https://www.youtube.com/watch?v=TBqXMWaxZYM•&list=PLyhmwFtznRhuz8L1bb3X9IbHrDMjHWWh

https://www.youtube.com/watch?v=j5Hml6KN4TI

- https://www.youtube.com/watch?v=X9GHBdyYeyo
- https://www.youtube.com/watch?v=1xWBPZnEJk8

•Activity Based Learning (Suggested Activities in Class) practical Based learning

https://www.vlab.co.in/broad-area-chemical-sciences•

https://demonstrations.wolfram.com/topics.php

- https://interestingengineering.com/science

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

24.01.2022

ENGINEERING CHEMISTRY LABORATORY			
Course Code	21CHEL16/26	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	0:0:2	SEE Marks	50
Credits	01	Exam Hours	3hrs

Course objectives:

CLO1	Quantitative analysis of materials by volumetric and chemical method.
CLO2	Instrumental methods for developing experimental skills in building technical competence

Sl.NO	Instrumentation Experiments
1	Estimation of FAS Potentiometrically using standard $K_2Cr_2O_7$ solution.
2	Estimation of Acids in acid mixture Conductometrically.
3	Determination of Viscosity coefficient of a given liquid using Ostwald's viscometer
4	Estimation of copper Colorimetrically.
5	Determination of pKa value of a given weak acid using pH meter
	Volumetric experiments
1	Estimation of Total hardness of water by EDTA complexometric method.
2	Determination of Nickel using EDTA by complexometric method
3	Determination of percentage of copper in brass using standard sodium thiosulphate solution.
4	Determination of Chemical oxygen demand of industrial waste water.
5	Estimation of percentage of iron in the given rust solution using standard Potassium Dichromate solution (External indicator method)
	Demonstration Experiments (For CIE only)
1	Estimation of Sodium & Potassium in the given sample of water using Flame Photometer.
2	Synthesis of nanomaterial by Precipitation method.

Course outcomes (Course Skill Set):

At the end of the course the student will be able to:

CO1	Determine the pKa and coefficient of Viscosity of a given organic liquid.
CO2	Estimate the amount of substance present in the given solution using Potentiometer Conductometric and Colorimetric.
CO3	Determine the total hardness and chemical oxygen demand in the given solution by volumetric analysis method
CO4	Estimate the percentage of Nickel, copper and Iron in the given analyte solution by titration method.
CO5	Demonstrate flame photometric estimation of sodium & potassium and the synthesis of nanomaterials by Precipitation method.

24.01.2022

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each course. The student has to secure not less than 35% (18 Marks out of 50) in the semester-end examination(SEE).

Continuous Internal Evaluation (CIE):

CIE marks for the practical course is **50 Marks.**

The split-up of CIE marks for record/ journal and test are in the ratio **60:40.**

- Each experiment to be evaluated for conduction with observation sheet and record write-up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments designed by the faculty who is handling the laboratory session and is made known to students at the beginning of the practical session.
- Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks.
- Total marks scored by the students are scaled downed to 30 marks (60% of maximum marks).
- Weightage to be given for neatness and submission of record/write-up on time.
- Department shall conduct 02 tests for 100 marks, the first test shall be conducted after the 8th week of the semester and the second test shall be conducted after the 14th week of the semester.
- In each test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce.
- The suitable rubrics can be designed to evaluate each student's performance and learning ability. Rubrics suggested in **Annexure-II of Regulation book**
- The average of 02 tests is scaled down to **20 marks** (40% of the maximum marks).

The Sum of scaled-down marks scored in the report write-up/journal and average marks of two tests is the total CIE marks scored by the student.

Suggested Learning Resources:

Text Books:

1 Vogel's A.I. A text book of quantitative analysis, 35th edition, 2012.
2 Willard, Merit, Dean and Settle, A text book of Instrumental analysis, 6th edition 2012.

Reference books:

1. G.H Jeffery, J Bassett, J Mendham and R.C. Denney Vogel's A.I. A text book of quantitative analysis, Dorling Kindersley (India) Pvt., Ltd 35th edition, 2012.
2. Gary D Christian, Analytical Chemistry, Wiley India, 6th edition, 2015.
3. T. Pradeep, A Text book of Nanoscience and Nanotechnology, McGraw Hill Education (India) Pvt., Ltd., 1st edition, 2015

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Assignment Questions

Module -1 Electrochemistry & Energy Storage Systems

Electrochemistry:-

1.Derive Nernst Equation for Single electrode potential?
2.Define reference electrode and Ion selective electrode?
3.Explain construction &working of calomel electrode?
4.Explain the construction & working of Glass electrode?
5.Explain the determination of $_pH$ using Glass electrode?

ENERGY STORAGE SYSTEMS:-

1.Write a note on classification of batteries?
2. Explain the construction & working of Li-ion battery?
3.Write a note on recycling of Li-ion batteries by direct method?
4.Write a note on advantages of Li-ion battery for electric vehicles?

Module -2 Corrosion & Metal finishing

Corrosion:-

1.Explain the electrochemical theory of corrosion taking Fe as example?
2.Write a note on factors affecting the rate of corrosion
i) Ratio of anodic to cathodic areas ii) $_pH$
3. Write a note on factors affecting the rate of corrosion
i) Nature of corrosion product ii)conductivity iii) Temperature
4.Explain about Differential metal corrosion?
5.Explain about Differential aeration corrosion ? (pitting & Water-line)
6.Write a note on Anodizing?
7. Write a note on galvanization?
8.Define cathodic protection? Explain about sacrificial anodic method?
9.Explain about impressed current method?

Metal Finishing:-

1.Write a note on Technological importance of Metal Finishing?
2. Explain the electroplating of Chromium?
3.Mention the differences between between electroplating & electroless plating?
4. Explain the electrolessplating of Copper?

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Module -3 Fuels & Solar Energy

Polymers:-

1. Explain synthesis and applications of polyurethanes?
2. Explain synthesis and applications of Kevlar fibre?
3. Explain mechanism of conduction in polyaniline
4. Explain synthesis and applications of polylactic acid?

Nano Materials:-

1. Explain the sysnthesis of nanomaterials by sol-gel method?
2. Explain the sysnthesis of nanomaterials by precipitation method?
3. Write a note on graphene?
4. Write a note on carbon Nano tubes?
5. Write a note on Fullerenes?

Module-4 Green chemistry and Alternative energy sources

Green Chemistry

1. Write a note on oxides of nitrogen?
2. Write a note on oxides of sulphur?
3. Write a note on oxides of carbon?
4. Write a note on principles of green chemistry?
5. Write a note on microwave synthesis?
6. Write a note on biocatalysed reactions?
7. Explain synthesis of adipic acid by conventional and green route?
8. Explain synthesis of paracetamol by conventional and green route?

Solar Energy:-

1. Explain construction & working of photovoltaic cell?

Green Fuel:-

1. Explain photocatalytic and photoelectron catalytic water splitting?
2. Explain the construction & working of CH_3OH -O_2 fuel cell?

Module-5 Chemical analysis and Instrumental method of analysis

Water Chemistry:-

1.Define COD? Explain the determination of COD of waste water sample?
2. Explain the determination of hardness of water sample?

Instrumental method of analysis:-

1. Explain instrumentation and application of flame photometry?
2. Explain instrumentation and application of potentiometry?
3. Explain instrumentation and application of conductometry?

Chemical Analysis:-

1. Explain the principles of titrimetric analysis?
2. Define normality, molarity, molality and molefraction, ppm

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CBCS SCHEME

USN | | | | | | | | | | |

21CHE12

First Semester B.E./B.Tech. Degree Examination, Feb./Mar. 2022
Engineering Chemistry

Time: 3 hrs. Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. What are Reference Electrodes? Explain the construction and working of Calomel Electrode. **(07 Marks)**

b. Define Single Electrode Potential. Derive Nernst equation for Single Electrode Potential. **(07 Marks)**

c. Explain the construction and working of Li – ion battery. Mention its applications. **(06 Marks)**

OR

2 a. Explain Primary , Secondary and Reserve batteries with an example. **(06 Marks)**

b. Explain the experimental determination of pH by using glass electrode. **(07 Marks)**

c. A cell consists of Copper rod dipped in 5M $CuSO_4$ solution and Iron rod dipped in 0.05 M $FeSO_4$ solution. Given $E^0_{Cu} = +0.34V$ and $E^0_{Fe} = -0.44V$. Write Cell representation , Cell reactions and calculate Emf of the cell. **(07 Marks)**

Module-2

3 a. Define Corrosion. Describe Electrochemical theory of corrosion by taking Iron as an example. **(07 Marks)**

b. What is Cathodic Protection? Explain Sacrificial Anodic method and Impressed Current method of Cathodic protection. **(07 Marks)**

c. What is Metal Finishing? Mention technological importance of Metal Finishing. **(06 Marks)**

OR

4 a. Explain the factors affecting the corrosion rate :
i) Ratio of anodic to cathodic areas.
ii) Nature of the corrosion product.
iii) pH. **(06 Marks)**

b. What is Corrosion Penetration Rate? A piece of corroded plate was found in the submerged ocean vessel. It was estimated that the original area of the plate was 10 $inch^2$ and that approximately 2.6kg had corroded away during the submersion for a period of 10 years. Calculate Corrosion Penetration Rate (CPR) in terms of mpy and mmy. Given
density (ρ) of iron = 7.9 g/dm^3
mpy → k = 534
mmy → k = 87.6. **(07 Marks)**

c. What is Electroless Plating? Write the differences between Electroplating and Electroless plating. **(07 Marks)**

Module-3

5 a. What are Conducting Polymers? Explain the mechanism of conduction in Polyaniline. **(07 Marks)**

b. Explain the synthesis , properties and applications of Poly Lactic Acid. **(06 Marks)**

c. What are Nanomaterials? Explain the synthesis of Nanomaterials by Sol – gel process. **(07 Marks)**

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

OR

6 a. What are Polymer Composites? Explain the synthesis and applications of Kevlar fibre. **(07 Marks)**

b. Explain any two size dependent properties of Nanomaterials. **(06 Marks)**

c. Write a note on Fullerene and mention its applications. **(07 Marks)**

Module-4

7 a. What is Green Chemistry? Explain briefly any six basic principles of Green Chemistry. **(07 Marks)**

b. Describe the production of hydrogen by Photocatalytic Water Splitting Method. **(06 Marks)**

c. Explain the synthesis of Paracetamol by Conventional and Green Route Method. **(07 Marks)**

OR

8 a. Explain the impacts of Oxides of Nitrogen (NO_x) and Oxides of Sulfur (SO_x) on the Environment. **(06 Marks)**

b. Explain the working of Photovoltaic cell, with a neat diagram. **(07 Marks)**

c. Describe working of Methyl alcohol – Oxygen fuel cell [$CH_3OH - O_2$] with a neat diagram. Mention its applications. **(07 Marks)**

Module-5

9 a. Explain Theory , Instrumentation and Applications of Colorimeter. **(07 Marks)**

b. Explain the principle of Volumetric analysis and requirement of Volumetric analysis. **(06 Marks)**

c. Define Biological Oxygen demand and Chemical Oxygen demand.
25 mℓ of waste water required 18.0mℓ and 25.2mℓ of 0.1N FAS solution for sample and blank titration respectively. Calculate COD of the waste water sample. **(07 Marks)**

OR

10 a. Explain applications of Conductometry :
i) Strong acid Vs Strong base ii) Weak acid Vs Strong base. **(07 Marks)**

b. Define the following units of Standard Solution :
i) Normality ii) Molarity iii) PPM. **(06 Marks)**

c. $25m^3$ of hard water sample titrated against 0.01M EDTA solutions consumed 18.0 cm^3 of EDTA solution. $25cm^3$ same sample of hard water was boiled , filtered and titrated against 0.01M EDTA solution consumed 12.0 cm^3 EDTA solution. Calculate Total , Permanent and Temporary hardness of the water sample. **(07 Marks)**

* * * * *

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CBCS SCHEME

USN | | | | | | | | | | |

21CHE12/22

First/Second Semester B.E. Degree Examination, Jan./Feb. 2023
Engineering Chemistry

Time: 3 hrs. Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. What is electrode potential? Derive Nernst equation for single electrode potential. **(07 Marks)**
b. Explain construction, working and applications of glass electrode. **(07 Marks)**
c. Explain the classification of batteries with suitable examples. **(06 Marks)**

OR

2 a. Discuss the construction, working and applications of Li – ion battery. **(07 Marks)**
b. Explain Recycling of Li – ion battery by direct cycling method. **(07 Marks)**
c. An electrochemical cell consists of a copper electrode dipped in 0.5m $CuSO_4$ and silver electrode dipped in 0.25m $AgNO_3$ solution. Write the cell scheme, cell reaction. Also calculate the emf. (Standard electrode potential of Cu and Ag are 0.34 and 0.80V respectively). **(06 Marks)**

Module-2

3 a. Explain electrochemical theory of a corrosion by taking Fe as an example. **(07 Marks)**
b. What is cathodic protection? Discuss sacrificial anodic method. **(07 Marks)**
c. Discuss electroplating of chromium with applications. **(06 Marks)**

OR

4 a. Define electroless plating. Discuss electroless plating of copper. **(07 Marks)**
b. What is metal finishing? Mention any 5 technological importance. **(07 Marks)**
c. Explain the influence of following factors on corrosion rate :
i) Ratio of anodic to cathodic area
ii) Nature of corrosion product
iii) pH. **(06 Marks)**

Module-3

5 a. Explain the synthesis and applications of polyurethane. **(07 Marks)**
b. What are biodegradable polymer? Explain the synthesis and applications of polylactic acid. **(07 Marks)**
c. Give the properties and applications of carbon nanotubes. **(06 Marks)**

OR

6 a. Explain synthesis of nanomaterials by Sol-Gel method. **(07 Marks)**
b. What are conducting polymers? Explain the mechanism of conduction in polyaniline. **(07 Marks)**
c. What are polymer composites? Explain the synthesis and properties of Kevlar Fiber. **(06 Marks)**

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Module-4

7 a. Explain any six basic principle of green chemistry. **(07 Marks)**
b. Explain the synthesis of Adipic acid from benzene and green synthesis from glucose. **(07 Marks)**
c. Discuss the construction and working of photovoltaic cell. **(06 Marks)**

OR

8 a. Explain the construction and working of methanol-oxygen fuel cell. **(07 Marks)**
b. Briefly explain the impacts of oxides of nitrogen and oxides of sulphur on environment. **(07 Marks)**
c. Write short notes on microwave synthesis and bio catalyzed reaction with examples. **(06 Marks)**

Module-5

9 a. What is hard water? Explain the determination of hardness using EDTA titration. **(07 Marks)**
b. In a COD test, 28.1 and 14.0 cm^3 of 0.05N FAS (Ferrous Ammonium Sulphate) solution was required for blank and sample titration respectively. The volume of test sample taken was $25cm^3$. Calculate the COD of the sample. **(07 Marks)**
c. Explain conductometric titration method for the determination of mixture of strong acid and weak acid with strong base. **(06 Marks)**

OR

10 a. Explain the principle and instrumentation of colorimetry. **(07 Marks)**
b. Define the terms normality, molarity and molality. **(07 Marks)**
c. Define primary and secondary standard solutions, explain briefly the requirement of primary standard solution. **(06 Marks)**

* * * * *

USN | 1 | C | E | | | | | | | |

CITY ENGINEERING COLLEGE
I Internal Test

Course:- Engg. Chemistry 21CHE12
Programme:- CS, AI, EC, IS
Sem & Sec:- I & C,D

Date:- 25/01/2022
Time:-10.30-12.00 P.M
Max.Marks-40

Q.No.	ANSWER ALL QUESTIONS	MARKS	CO'S	BT Level
	PART-A			
1.	Derive Nernst equation for single electrode potential?	10	CO1	BT1
	OR			
2.a)	Explain construction and working of calomel electrode?	5	CO1	BT3
b)	Explain determination of PH using glass electrode?	5	CO1	BT3
	PART-B			
3.	Explain construction and working of Glass Electrode?	10	CO1	BT2
	OR			
4.a)	Electrochemical cell consists of Cu electrode dipped in 0.5M $CuSO_4$& Ag electrode dipped in 0.25M $AgNO_3$. Write cell rep., half cell and net cell reactions. Also calculate EMF. SRP of Cu & Ag are 0.34V&0.8V	5	CO1	BT5
b)	Calculate EMF of a cell Mg/ $Mg^{2+}_{(0.130M)}$ //$Ag^{+}_{(0.0001M)}$/ Ag, if E^0cell = 3.17V.	5	CO1	BT5
	PART-C			
5.	Define metallic corrosion. Discuss electrochemical theory of corrosion taking iron as example?	10	CO1	BT5
	OR			
6.a)	What is the effect of areas of anode and cathode on rate of corrosion?	5	CO2	BT2
b)	Give the principle of differential aeration corrosion and give an example?	5	CO2	BT2
	PART-D			
7.a)	Write a note on differential metal corrosion?	5	CO2	BT2
b)	Explain galvanization process?	5	CO2	BT2
	OR			
8. a)	What is the effect of nature of corrosion product on the rate of corrosion?	5	CO2	BT1
b)	Explain the effect of PH, temperature and humidity factor on rate of corrosion?	5	CO2	BT2

Course outcomes:-
CO1--- Use of free energy in equilibria, rationalize bulk properties and processes using thermodynamic considerations, electrochemical energy systems.
CO2-- Causes and effects of corrosion of metals and control of corrosion.
Blooms Taxanomy:-
BT1—Knowledge BT2---Understand BT3---Apply BT5----Evaluate.

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF .....

SCHEME FOR VALUATION_

Internal Test .....

Semester & Section:

Date:

Question No.		Details of the answer	Marks Distribution	Total Marks
4.	a.	$E_a = E_b + E_{Ag\|AgCl} + E_{asym.}$	1M	2M.
		$= L - 0.0591 + E_{Ag\|AgCl} + E_{asym.}$		
		$\boxed{E_a = L_1 - 0.0591\, pH}$	1M	
		$E = E^\circ_{cell} + 2.303 \frac{RT}{nF} \log \frac{[\text{Metal ion at cath}]}{[\text{Metal ion at cath}]}$	1M.	5M.
		$= 0.46 + \frac{0.0591}{2} \log \frac{(0.25)^2}{(0.5)}$	1M.	
		$= 0.46 + 0.02955\,(-0.9030)$	1M	
		$= 0.46 - 0.0266 = 0.433\,V.$	2M	
	b.	formula	1M.	5M.
		$E_{cell} = 3.17 + \frac{2.303 \times 8.314 \times 298}{2 \times 96500} \log \frac{(0.0001)^2}{(0.130)}$	2M + 1M	
		$= 2.96\,V.$ $\quad 7.6923 \times 10^{-5}$	1M	
5.		$Fe \longrightarrow Fe^{2+} + 2e^-$ + Expl.	5M	10 M
		$O_2 + 2H_2O + 4e^- \longrightarrow 4OH^-$		
		$2H_2O + 2e^- \longrightarrow H_2 + 2OH^-$		
		$2H^+ + 2e^- \longrightarrow H_2.$	5M	
		$Fe(OH)_2 + O_2 + (n-2)H_2O \longrightarrow Fe_2O_3 \cdot nH_2O.$		

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF ..... Chemistry .....

SCHEME FOR VALUATION_

Internal Test ..... I .....

Semester & Section: I, C & D.

Date: 25/1/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
1.	2 Def.	1×2	2M.
	$\Delta G = -nFE$, $\Delta G^\circ = -nFE^\circ$, $\Delta G = \Delta G^\circ + RT \ln K_c$	1×3	3M
	Substitution + $\frac{-nEF}{-nF} = \frac{-nFE^\circ}{-nF} + \frac{RT}{-nF} \ln \frac{[M]}{[M^{n+}]}$	2M	3M
	$E = E^\circ - \frac{RT}{nF} \ln [M^{n+}]$ $M = 1$.	1M	
	$E = E^\circ + \frac{RT}{nF} \ln [M^{n+}]$ $E = E^\circ + \frac{2.303 \times 8.314 \times 298}{n \times 96500} \log [M^{n+}]$	1+1	2M
2. a.	Fig. + Expl. + reactions + Emf.	1+4+2+1	5m.
	Anode:- $2Hg + 2Cl^- \longrightarrow Hg_2Cl_2 + 2e^-$		
	$Hg_2Cl_2 + 2e^- \longrightarrow 2Hg + 2Cl^-$		
b.	Fig. + Expl. + formula.	2+1+2	5m.
	$E_{cell} = E_a - E_{SCE}$		
	$E_{cell} = L_1 - 0.0591\, pH - E_{SCE}$		
	$pH = \frac{L_1 - E_{SCE} - E_{cell}}{0.0591}$		
3.	construction :- Expl. + composition + Fig.	1+1+1	3m.
	working :- Fig. + E_b + E_a.		
	$E_b = E_1 - E_2$.	1	5M.
	$= \frac{RT}{nF} \ln C_2 - \frac{RT}{F} \ln C_1$	1	
	$-\frac{RT}{F} \ln C_1 + \frac{RT}{F} \ln C_2$.	1	
	$= L + 0.0591 \log [H^+]$ $E_b = L - 0.0591\, pH$	2	

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF .....

SCHEME FOR VALUATION_

Internal Test .....

Semester & Section: Date:

Question No.	Details of the answer	Marks Distribution	Total Marks
6. a.	Expl.	5M	5M
b.	Expl. + fig.	4+1	5M
7. a.	Expl. + Fig.	4+1	5M
b.	Expl. + fig.	4+1	5M
			5M
8. a.	Expl.		5M
b.	Expl.		

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN | 1 | C | E | | | | | - | | |

CITY ENGINEERING COLLEGE

II Internal Test

Course:- Engg. Chemistry 21CHE12
Programme:- CS, AI, EC, IS
Sem & Sec:- I, C, D

Date:- 03/03/2022
Time:-10.30-12.00
Max.Marks-40

Q.No.	ANSWER ALL QUESTIONS	MARKS	CO'S	BT Level
	PART-A			
1.a)	Define metal finishing? Write any 4 technological importance of metal finishing?	4	CO2	BT2
b)	Develop electroplating process of hard chromium with reactions?	6	CO2	BT6
	OR			
2.a)	Create electroless plating of copper with suitable reactions?	6	CO2	BT6
b)	In a COD test 30.2 cm^3 and 14.5 cm^3 of 0.05N FAS solution are required for blank and sample titration respectively. The volume of test sample used was 25 cm^3. Calculate COD of sample titration?	4	CO5	BT5
	PART-B			
3.	Explain procedure, principle & Calculation for COD estimation?	10	CO5	BT5
	OR			
4.a)	Calculate total hardness, permenant hardness and carbonate hardness for a 100 ml water sample which consumes 12.5 ml of 0.01M EDTA before boiling and consumes 10 ml of same EDTA after boiling?	5	CO5	BT2
b)	Write 5 Differences between electroplating and electroless plating process?	5	CO2	BT5
	PART-C			
5.	Explain theory and Instrumentation of potentiometry?	10	CO5	BT4
	OR			
6.a)	Explain instrumentation of colorimetry?	6	CO5	BT1
b)	Write a note on anodizing?	4	CO5	BT2
	PART-D			
7.	Explain theory and Instrumentation of flame photometry?	10	CO5	BT4
	OR			
8.	Define PV cell and discuss the working principle with a diagram?	10	CO4	BT6

Course outcomes:-
CO2-- Modification of surface properties of metals to develop resistance to corrosion, wear. Tear, impact etc. by electroplating and electrolessplating.
CO5 –Understand the basic concepts of water chemistry and theory.
CO4- Understanding the concepts of alternative energy sources

Blooms Taxanomy:-
BT1—Knowledge, BT2---Understand , BT3---Apply . BT4—Analyzing , BT5----Evaluate ,BT6-- creating.

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF Chemistry

SCHEME FOR VALUATION_

Internal Test II

Semester & Section: I, C,D.

Date: 03/03/2022.

Question No.	Details of the answer	Marks Distribution	Total Marks
1. a.	Def + 3 tech. importance	1M+3M.	4M.
b.	Pretreatment of object	2M.	6M.
	composition of plating bath + reactions	2+2	
2. a.	Catalytic activation of object	1M.	6M.
	composition of plating bath + reactions	3+2	
b.	1 ml of 1N FAS = 8 mg of O_2.		4M.
	(30.2-14.5) ml of 0.05N FAS = ?	2M	
	25ml of waste water = (30.2-14.5)×0.05×8		
	1000ml of waste water = ?		
	$\therefore COD = \frac{1000 \times (30.2-14.5) \times 0.05 \times 8}{25}$	2M.	
	COD = 251.2 mg of O_2/L.		
3.	procedure, principle, cal.	4+2+4	10M.
4.	Total Hardness:-		5M
	1000ml of 1M EDTA = 100g of $CaCO_3$.		
	12.5ml of 0.01M EDTA = ?		
	100ml of sample water = $\frac{12.5 \times 0.01 \times 100}{1000}$	2M.	
	10^6 ml of sample water = $\frac{10^6 \times 12.5 \times 0.01 \times 100}{1000 \times 100}$		
	= 125 ppm of $CaCO_3$.		

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF .....

SCHEME FOR VALUATION_

Internal Test .....

Semester & Section:

Date:

Question No.	Details of the answer	Marks Distribution	Total Marks
	Permanent Hardness: $= \frac{10 \times 0.01 \times 1000 \times 106}{1000 \times 100}$	2M	
	$= 100$ ppm of $CaCO_3$.		
	Temp. Hardness $= 125 - 100$	1M	
	$= 25$ ppm of $CaCO_3$		
b.	5 diff b/w electroplating & electroless plating		5M
(5)	Theory; Instrumentation of polarimetry	5+5	10 M.
6. (a)	Instrumentation of colorimetry		6M.
(b)	Anodizing.		4M.
(7)	Theory; Instrumentation of flame photometry	5+5	10 M
(8)	Definition + working + fig.	2+6+2	10 M

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

III Internal

Course :- Engg. Chemistry 21CHE12
Programme :- CS, AI, EC, IS
Sem & Sec:- I & C, D

Date:-12/04/2022
Time:- 10.30-12.00
Max.Marks-40

Q.No	ANSWER ALL QUESTIONS	MARKS	CO'S	BT Level
	PART-A			
1.a)	What are polymer composites? Describe manufacture and applications of Kevlar fibre?	5	CO3	L2
b)	Describe the synthesis and applications of polyurethane?	5	CO3	L2
	OR			
2.	Discuss the mechanism of conduction in polyaniline?	10	CO3	L3
	PART-B			
3.a)	Write the synthesis and applications of poly lactic acid?	5	CO3	L2
b)	A sheet of carbon steel one meter wide by three mts long gas lost 40g to corrosion over the past 6 months. Cnvert that mass loss to a penetration rate of the steel in mm units and mpy units. What would be the corrosion rate? (carbon steel density= 7.8g/cm3)_ Calculate CPR in mmpy.	5	CO2	L5
	OR			
4.a)	Explain size dependant properties of nano materials a) Optical properties b) Surface area	4	CO3	L2
b)	Explain synthesis of nano materials by precipitation method?	6	CO3	L3
	PART-C			
5.a)	Write a note on effect of CO_2 on environmental pollution?	5	CO4	L3
b)	Write a note on fullerenes?	5	CO3	L6
	OR			
6.	Explain synthesis of paracetamol by conventional and green method?	10	CO4	L3
	PART-D			
7	Explain synthesis of adipic acid by conventional and green method?	10	CO4	L3
	OR			
8.	Explain synthesis of nano materials by sol-gel method?	10	CO3	L2

Course Outcomes

CO2 –Explain the fundamental concepts of corrosion its control.
CO3—Enumerate the importance, synthesis and application of polymers. Understand properties and application of nanomaterials.
CO4---Describe the principles of green chemistry.

Blooms Taxonomy

L1- Remembering, L2 – Understanding, L3- Applying, L5 – Evaluating, L6- Creating

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF ...Chemistry.....

SCHEME FOR VALUATION_

Internal Test ...III.....

Semester & Section: I, C, D.

Date: 12/04/2022

Question No.	Details of the answer	Marks Distribution	Total Marks
1. a.	Def. + Manufacture + Applications.	1+2+2	5M
b.	Synthesis + Applications.	1+4	5M.
2.	conduction Mechanism. + fig.	5+5	10M.
3. a.	Synthesis + Applications.	1+4	5M.
b.	$CPR = \frac{K \times W}{P \times A \times T}$	2M	5M.
	$CPR = \frac{87.6 \times 40 \times 1000}{7.8 \times 3 \times 100 \times 100 \times 6 \times 30 \times 24}$	2M	
	$CPR = 3.466 \times 10^{-3}$ mmpy.	1M	
4. a.	Properties	2+2	4M
b.	Pitting agents, + eg.	3+3	6M
5. a.	Global warming + Effects of CO_2 on Plants & animals.	3+2	5M.

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF .....

SCHEME FOR VALUATION

Internal Test .....

Semester & Section:

Date:

Question No.	Details of the answer	Marks Distribution	Total Marks
b.	Structure + Synthesis + Application	2+1+2	5M
6.	conventional + Green method (Paracetamol)	5+5	10M
7.	conventional + green Method (Adipic Acid)	5+5	10M
8.	Hydrolysis + condensation reactions + Expl + fig.	1+2+5+2	10M

$M\text{-}O\text{-}R + H_2O \longrightarrow M\text{-}OH + R\text{-}OH$

$M\text{-}OH + M\text{-}OH \longrightarrow M\text{-}O\text{-}M + H_2O$

$M\text{-}OH + M\text{-}O\text{-}R \longrightarrow M\text{-}O\text{-}M + ROH$

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Year : 20_21_ - 20_22_ Semester : Odd / Even

Name of the Teacher : Dr. P. Rajasekhar & Dr. Sunitha N

Designation : HOD & Prof., Associate Prof.

Department : Chemistry

Sem/ Branch	Subject Code	Subject
1. I / CS	21CHE12/22	Engg. Chemistry
2.		
3.		

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff				
HOD				
Principal				

PRINCIPAL
CITY ENGINEERING COLLEGE

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ATTENDANCE

Sl. No.	Reg.No.	Name	3/1	5/1	7/1	11/1	12/1	13/1	14/1	18/1	19/1	20/1	1/2	2/2	3/2	4/2	% of Attendance
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	60
1	1CE21CS002	Abhishek. M.G	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
2	CS004	Aditya R. Ragate	1	2	3	3	4	5	6	7	8	9	10	11	12	13	
3	008	Anand	1	2	3	3	3	4	5	6	7	8	9	9	10	11	
4	012	Ankush kumar	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
5	013	Ashish S.A	1	2	3	4	5	6	7	8	9	10	11	12	12	13	
6	017	Beeresh. N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
7	020	Bharath Reddy. G	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
8	022	Bhamth. S bharathreddy949@gmail.com	1	2	3	4	5	6	7	8	9	10	11	11	12	13	
9	025	Chandrashekar. M.R	1	2	3	3	4	5	6	7	8	9	10	11	12	12	
10	026	Chethan. H.S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
11	029	Darshan. K.M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
12	033	Deepak. K	1	2	3	4	5	6	7	8	9	10	11	12	13	13	
13	034	Dhanush. R	1	2	3	4	5	6	7	8	8	9	10	11	12	13	
14	038	Ganesh Moti	1	2	3	4	5	6	7	8	8	9	10	11	12	13	
15	039	Gangothri. V	1	2	3	4	5	6	7	8	9	10	11	11	12	13	
16	042	Harsha Vardhan. S.M	1	2	3	4	5	6	7	8	9	10	11	11	12	13	
17	044	Harshitha. J.K	1	2	3	3	4	5	6	7	8	9	10	10	11	12	
18	045	Harshitha. M	1	2	3	4	5	6	7	8	9	10	11	12	12	13	
19	048	Harshitha. S.P	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
20	049	Hastaak khan	1	2	3	4	5	6	7	8	7	10	11	12	13	14	
21	053	Inchara. S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
22	054	Jaishankar Reddy. V	1	2	3	3	3	4	5	6	7	8	9	10	11	12	
23	052	Imdad Irshaad ul haq. V.T	1	2	3	3	4	5	6	7	8	9	10	10	11	12	
24	056	Kavyashree. V	1	2	3	4	5	6	7	8	9	10	11	11	12	13	
25	058	Keerthana. S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
	No. of Abs.																
	Initials																

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ASSESSMENT

Test Marks 40	40	40			Sessional Marks	Rema
1	2	3	25%	15%	25	
50	50	50				
31	24	23	20	20	40	
25	15	30	20	20	37	
20	22	16	20	20	35	
06	18	30	20	20	34	
39	30	31	20	20	46	
24	19	16	20	20	35	
40	40	39	20	20	50	
18	19	22	20	20	35	
36	24	18	20	20	39	
33	32	24	20	20	43	
11	19	25	20	20	35	
03	10	11	20	20	27	
29	35	25	20	20	43	
40	40	15	20	20	44	44
36	36	33	20	20	47	
18	22	10	20	20	33	
38	40	40	20	20	50	
31	32	14	20	20	40	
39	38	33	20	20	48	
19	20	17	20	20	35	
0	10	12	20	20	26	
36	24	30	20	20	43	
20	24	27	20	20	38	
37	38	30	20	20	47	
31	38	22	20	20	43	

ATTENDANCE

	Reg.No.		3/1	8/1	7/1	12/1	12/1	13/1	14/1	18/1	19/1	20/1	1/2	2/2	3/2	4/2	60	% of Attendance
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		
6	059	Keerthana. V	1	2	3	4	5	6	7	8	9	9	10	11	12	13		
7	060	Kiran. M	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
8	061	Kishan. A	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
29	068	Meghana. N	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
30	069	Mikihisha Karibe	1	2	3	3	4	5	6	6	7	8	9	10	11	12		
31	070	Mohammad Jafar	1	2	3	4	5	6	7	8	9	10	11	12	12	13		
32	072	Mohd. Dawood	1	2	3	4	5	6	7	8	9	10	11	11	11	12		
33	077	Mohd. Safwaan Shariff. A	1	2	3	4	5	6	7	8	9	10	11	11	12	13		
34	079	Mohan krishna. D	1	2	3	3	4	5	6	7	8	9	10	11	12	13		
35	080	Monica. R	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
36	084	Nisarga. M. U	1	2	3	4	5	6	7	8	9	10	11	11	12	13		
37	086	Nivedita. R. D	1	2	3	3	4	5	6	7	8	9	10	11	12	13		
38	088	P. Shamanth	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
39	091	Praina Dattatraya	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
40	CS101	Ratnesh	1	2	3	3	3	4	5	6	7	8	9	10	11	12		
41	CS104	Rimah Manal	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
42	CS106	Rupla. S. Jadav	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
43	CS108	S. Naina Shallet	1	2	3	4	5	6	7	8	9	9	10	11	12	13		
44	CS110	Saif Ali Badal	1	2	3	4	5	6	7	8	9	10	11	11	12	13		
45	CS113	Sannidhi. N. D	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
46	CS114	Satish. C	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
47	CS116	Sharath Surgimath	1	2	3	3	3	4	5	6	6	7	8	9	10	11		
48	CS118	Shashank Rao. L	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
49	CS119	Shashank T. S	1	2	3	4	5	6	7	8	8	9	10	11	12	13		
50	CS120	Shilpa. S	1	2	3	4	5	6	7	8	9	9	10	10	11	12		
	No. of Abs.																	
	Initials																	

ASSESSMENT

Test Marks 1 (40)	Test Marks 2 (40)	Test Marks 3 (40)	Assign	Sem	Sessional Marks (25)	Remarks
25	38	25	20	20	43	
39	35	31	20	20	47	
36	40	40	20	20	49	
35	38	33	20	20	47	
4	10	4	20	18	24	
27	35	35	20	20	45	
30	29	28	20	20	42	
38	29	40	20	20	47	
0	21	18	20	20	30	
40	40	33	20	20	49	
19	33	40	20	20	44	
30	30	17	20	20	40	
39	40	38	20	20	50	
39	40	24	20	20	46	
20	26	35	20	41	41	
19	26	26	20	20	38	
28	30	15	20	20	39	
30	40	38	20	20	47	
33	36	29	20	20	45	
40	36	40	20	20	49	
16	28	02	20	20	32	
0	15	12	20	20	27	
09	18	29	20	20	35	
40	40	39	20	20	50	
07	14	25	20	20	32	

LESSON PLAN

Week	Date From	Date To	Topics Planned
I	3/1/22	8/1/22	Electrochemistry:- Introduction, EMF of cell, Free energy, single electrode Potential, Derivation of Nernst Equation, Numerical Problems, Reference electrodes:- Construction, working of
II	10/1/22	15/1/22	calomel electrode, ion selective electrodes, Introduction, working of glass electrode, determination of pH using glass electrod, Energy storage systems:- Classification of batteries
III	17/1/22	21/1/22	(primary, secondary, resevied batteries), Li-ion battery, Advantages of Li-ion battery as an electrochemical energy system for electric vehicles, Recycling of Li-ion batteries, Sodium-ion battery.
IV	24/1/22	29/1/22	Corrosion:- Introduction, electrochemical theory of corrosion, factors affecting rate of corrosion, ratio of anode to cathodic areas, nature of corrosion product nature of medium - pH, conductivity, temp.
V	31/1/22	5/2/22	Types of corrosion:- Differential metal, aeration Inorganic coating, Anodizing of 'Al', Cathodic Protection - Sacrificial anode and impressed current methods, Galvanization, corrosion Penetration rate, Numerical Problems on CPR.
VI	7/2/22	12/2/22	Metal Finishing:- Technological importance, Electroplating of 'Cr', Electroless Plating, distinction between electroplating & electroless plating, Electroless Plating of 'Cu'.
VII	14/2/22	19/2/22	Polymers:- Introduction, Synthesis, application of Polyurethane, Polymer composites - Synthesis, Properties of kevlar fibre. Conduding Polymer:- Synthesis, Mech. of conduction of
VIII	21/2/22	26/2/22	Polyaniline, factors influencing conductivity of organic polymers, Synthesis, mech., Conduction in Pani, factors influencing Conductivity of organic Polymers.

LESSON PLAN

Week	Date From	Date To	Topics Planned
IX	28/2/22	5/3/22	Biodegradable Polymers:- Synthesis, Properties, applications of Polylactic acid. Nanomaterials:- Size dependent properties, Synthesis of Nano materials, Top down & bottom up approaches, Sol-gel, precipitation method, fullerenes, carbon nanotubes, graphenes - Introduction, Properties, applications.
X	7/3/22	12/3/22	
XI	14/3/22	19/3/22	Green Chemistry:- Introduction, definition, Basic principles of green chemistry, Microwave synthesis, biocatalysed reactions, Merits of degradation, Super critical conditions for
XII	21/3/22	26/3/22	solvent free reaction, synthesis of typical organic compounds by conventional & green route: (i) adipic acid (ii) Paracetamol. Synthesis of ethylene oxide & methyl methacrylate, problem on atom economy.
XIII	28/3/22	2/4/22	Green fuel:- Hydrogen production, applications in hydrogen fuel cells, construction, working
XIV	4/4/22	8/4/22	& application of Methanol- O2 fuel cell. Solar energy:- construction working of Photovoltaic cell Water Chemistry:- Hardness of water, Problems
XV	18/4/22	23/4/22	hardness of water, BOD, COD, Problems on COD. Volumetric analysis:- Principles of titrimetric analysis, units of standard solutions (N, M, m, mole fraction, PPM).
XVI	25/4/22	30/4/22	Instrumental method of analysis:- Colorimetry, flame photometry, Potentiometry, conductometry SA with SB, WA with SB, mixture of SA & WA with SB).

Teachers Signature

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

HOD'S Signature

RECORD OF CLASS WORK

Date	Period	Topics Covered
3/1/22	5th 2.00-2.50	Introduction of Electrochemistry
5/1/22	1st 9.30 - 10.20	Derivation of Nernst Eqn.
12/1/22	1st	Construction & working of calomel electrode.
13/1	4th	Construction of glass electrode. Problems on Nernst Eqn.
19/1	1st	Construction, working of glass electrode Determination of pH using glass electrode
20/1	4th	Problem on Nernst Eqn.
2/2	1st	Energy storage system - Construction & working of Li-ion battery.
3/2	4th	Metal finishing - Electroplating of Cr. Technological importance of Metal finishing.
7/2	3rd	Electroless plating of Cu, Diff. btw electroplating & electroless plating Procen.
9/2	1st	BOD, COD, Determination of COD of waste water sample.
15/2	5th	Determination of Total Hardness of water (online)
16/2	1st	Determination of total hardness of water (offline) & Problems on it
16/2 (Revised)	3rd	Problems on COD & Hardness of water.
17/2	4th	Problems on COD & Hardness.
23/2	1st	Model question paper problem.
24/2	4th	Nano Materials:- Size dependent properties of N.M.

Teachers Signature

HOD'S Signature

RECORD OF CLASS WORK

Date	Period	Topics Covered
9/3	1st	Synthesis of Nano Materials by sol-gel
10/3	4th	Synthesis of Nano materials by PPB
16/3	1st	Fullerenes, graphene, CNT
17/3	4th	Synthesis of organic comp. (Adipic) by conventional & green route.
23/3	1st	Principles of green chemistry
24/3	4th	Synthesis of Paracetamol.
28/3	3rd	Oxides of Carbon.
31/3	4th	Microwave synthesis.
6/4	1st	Biocatalyzed reactions.
8/4	4th	Photocatalytic water splitting
20/4	1st	Photoelectrocatalytic water splitting
21/4	4th	H_2-O_2 fuel cell. Applications.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Teachers Signature

HOD'S Signature

CITY ENGINEERING COLLEGE
Doddakallasandra, Bangalore-560061

DEPARTMENT OF CIVIL ENGINEERING

CIRCULAR

Ref No: CEC/CV/DAC/ACY 2021-2022/01 Date: 29-09-2021

This is to inform the members of Department Advisory Committee that meeting is scheduled on 29-09-2021 at 10: 00 AM in CV department.

Agenda:

- Planning of Internships & Project work for 7th semester students.
- Involving students in technical activities.
- Planning for stock verification of labs.
- Conducting workshop/seminar/guest lectures.
- Planning to improve result of students.
- Planning to conduct value added course for student.
- Planning of Course preference, Course allocation & Work load distribution for upcoming odd semester.

Dr. Thippeswamy H N

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE
Doddakallasandra, Bangalore-560061

DEPARTMENT OF CIVIL ENGINEERING

Department Advisory Committee Meeting

Date: 29/09/2021
Time: 10:00 AM
Venue: CV Department

DAC Members Present:

Sl. No	Member Name	Designation	Role
1	Dr. H N THIPPESWAMY	HOD	Convenor
2	Mr. MAHESH KUMAR M C	Assistant Professor	Member
3	Mr. GURUPRASAD N	Assistant Professor	Member
4	Mr. VINAYKUMAR S N	Assistant Professor	Co-Convenor
5	Mr. Pavan kumar P N	Assistant Professor	Member
6	Mr. NISHANTH KUMAR	Assistant Professor	Member
7	Mrs. Vidyadhare C V	Assistant Professor	Member
8	Mr. JAYANTH K S	Assistant Professor	Member
9	Mr. MANJUNATH K E	Assistant Professor	Member
10	Mr. ANANTHASWAMY M R	Senior Technical Manager, PropEdge Valuation Pvt. Ltd	Alumni (Industry Expert)
11	Mr. Hari prasad S	V J Construction, Senior Engineer	Alumni

The Department Advisory Committee meeting was conducted at Department of CV, on 29th September, 2021, at 10 AM.

Agenda of the Meeting:

- Planning of Internships & Project work for 7th semester students.
- Involving students in technical activities.
- Planning for stock verification of labs.
- Conducting workshop/seminar/guest lectures.
- Planning to improve result of students.
- Planning to conduct value added course for student.
- Planning of Course preference, Course allocation & Work load distribution for upcoming odd semester.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty accomplishments and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The HOD welcomed all the staff for the meeting. The following points were discussed as follows.

- The stock verification has to be completed by the staff members who are in-charge of lab during 2020-21 and hand over to staff members who are in-charge of lab during 2021-22.
- It was proposed to conduct a workshop, seminars & guest lecture on recent trending topics.
- The staff members were informed to conduct classes and labs regularly, to timely conduct and complete the entrusted responsibility, to actively participate in the dept and college activities and finally to take suitable actions for getting results and admissions to the dept.
- The guide has to check and discuss about the internship practice taken by students of 7^{th} semester allocated to him or she. The guide must visit the site where internship is practiced by the students and discuss with supervisor of students at the site.
- The staff members should complete all the five modules and work hard to get 100% pass percentage. The staff members should find out the reasons for poor percentage in the concerned subject and submit report.
- Valuation data has to be submitted by all the faculties who involved in valuation.
  HOD thanked all the staff for having attended the meeting.

Dr. Thippeswamy H N

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF CIVIL ENGINEERING

CLASS ROOM: C401 **3rd Semester**

CLASS TEACHER: Prof. MANJUNATH K E W. E. F. – 1st OCTOBER 2021

DAY	9:00 to 10:00	10:00 to 11:00		11:15 to 12: 15	12:15 to 1:15		2:00 to 3:00	3:00 TO 4:00	4:00 to 5:00
	I	II		III	IV		V	VI	VII
MON	18CV34	18CV33	B	18MAT31	18CV32	B	18CVL37	18CVL38	
TUE	18CV32	18CV34	R	18MAT31	18CV35	R	18CVL37		
WED	18CV35	18CV33	E	18MAT31	18CV36	E	18CVL38		
THR	18CV36	18CV33	A	18MAT31	18CV32	A			
FRI	18CV32	18CV35	K	18CV34	18CV36	K			
SAT	18CPC39			*TUTORIAL*					

18MAT	Transform Calculus, Fourier Series and Numerical Techniques	Prof. Gayathri A
18CV3	Strength of Materials	Prof. Manjunath K. E.
18CV3	Fluid Mechanics	Dr.Thippeswamy HN
18CV3	Building Materials and Construction	Prof. Vinaykumar S N/Nishanth
18CV3	Basic Surveying	Prof. Jayanth K S/Pavan kumar P N
18CV3	Engineering Geology	Prof. Vidyadhare CV
18CVL	Computer Aided Building Planning & Drawing	Prof. Manjunath K. E./Guruprasad
18CVL	Building Materials Testing Laboratory	Prof. Jayanth K S/Nishanth
18CPC	Constitution of India, Professional Ethics and CyberLaw	Dr. Sunitha

HOD

HOD, CIVIL ENGG DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062

PRINCIPAL

Principal
City Engineering College,
Bangalore-560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF CIVIL ENGINEERING

CLASS ROOM: C402 **5th Semester**

CLASS TEACHER: Prof. VINAYKUMAR SN W. E. F. – 1st OCTOBER 2021

DAY	9:00 to 10:00	10:00 to 11:00		11:15 to 12: 15	12:15 to 1:15		2:00 to 3:00	3:00 TO 4:00	4:00 to 5:00
	I	II		III	IV		V	VI	VII
MON	18CV53	18CV54	B	18CV52	18CV52	B	18CV51	18CV51	
TUE	18CV51	18CV53	R	18CV55	18CV56	R	18CVL57	18CVL58	
WED	18CV52	18CV51	E	18CV53	18CV56	E	18CVL57		
THR	18CV56	18CV52	A	18CV53	18CV55	A	18CVL58		
FRI	18CV52	18CV55	K	18CV54	18CV54	K	*LIBRARY STUDIES*		
SAT	18CV53	18CIV59							

18CV51	Construction Management & Entrepreneurship	Prof. Jayanth K S
18CV52	Analysis of Indeterminate Structures	Prof. Manjunath K. E./Guruprasad
18CV53	Design of RC Structural Elements	Prof. Vidyadhare CV
18CV54	Basic Geotechnical Engineering	Prof. VinayKumar S. N.
18CV55	Municipal Wastewater Engineering	Prof. VinayKumar S. N./Mahesh kumar M C
18CV56	Highway Engineering	Prof. Jayanth K S/Pavan kumar P N
18CVL57	Surveying Practice	Prof. Jayanth K S/Pavan kumar P N
18CVL58	Concrete and Highway Materials Laboratory	Prof. Jayanth K S/Nishanth
18CIV59	Environmental Studies	Dr. Sunitha

HOD

HOD, CIVIL ENGG DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062

PRINCIPAL

Principal
City Engineering College,
Bangalore-560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF CIVIL ENGINEERING

CLASS ROOM: C406 **7th Semester**

CLASS TEACHER: Prof. VIDYADHARE C V

W. E. F. – 1st OCTOBER 2021

DAY	9:00 to 10:00	10:00 to 11:00		11:15 to 12: 15	12:15 to 1:15		2:00 to 3:00	3:00 TO 4:00	4:00 to 5:00
	I	II		III	IV		V	VI	VII
MON	18CV72	18CV71	B	18CV742	18CV732	B	18CVL76	18CVL77	
TUE	18CV71	18CV72	R	OE	18CV742	R	18CVL76		
WED	18CV732	OE	E	18CV71	18CV72	E	18CVL77		
THR	18CV742	18CV732	A	OE	18CV72	A	18CVP78		
FRI			K			K			
SAT									

18CV71	Quality Surveying and ContractManagement	Prof. VinayKumar S. N.
18CV72	Design of RCC and Steel Structures	Prof. Manjunath K. E./Guruprasad
18CV732	Air Pollution & Control	Prof. VinayKumar S. N./Mahesh kumar M C
18CV742	Design Concepts of Building Services	Prof. Vidyadhare CV
18ME751	Energy & Environment	Prof. Anil
18CVL76	Computer Aided Detailing of Structures	Prof. Vidyadhare CV/Guruprasad
18CVL77	Geotechnical Engineering Laboratory	Prof. VinayKumar S. N./Pavan kumar P N
18CVP78	Project Work Phase - 1	Dr.Thippeswamy HN

HOD

HOD, CIVIL ENGG DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062

PRINCIPAL

Principal
City Engineering College,
Bangalore-560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF CIVIL ENGINEERING

CLASS ROOM: C406 **7th Semester (2015 Scheme)**

CLASS TEACHER: Prof. VIDYADHARE C V W. E. F. – 1st OCTOBER 2021

DAY	9:00 to 10:00	10:00 to 11:00		11:15 to 12: 15	12:15 to 1:15		2:00 to 3:00	3:00 TO 4:00	4:00 to 5:00
	I	II		III	IV		V	VI	VII
MON	15CV72		B	15CV742	15CV73	B	15CVL77		15CVL76
TUE		15CV72	R	15CV71	15CV742	R	15CVL77		
WED		15CV73	E		15CV72	E	15CVP78		
THR	15CV742	15CV73	A	15CV72	15CV71	A			
FRI		15CV71	K	15CV751		K	15CVL76		
SAT	15CV751	15CV751							

15CV71	Municipal and Industrial Waste WaterEngineering	Prof. VinayKumar S. N./Mahesh kumar M C
15CV72	Design of RCC and Steel Structures	Prof. Manjunath K. E./Guruprasad
15CV73	Hydrology and Irrigation Engineering	Dr.Thippeswamy HN
15CV742	Design Concepts of Building Services	Prof. Vidyadhare CV
15CV751	Urban Transportation and Planning	Prof. Jayanth K S/Pavan kumar P N
15CVL76	Environmental Engineering Laboratory	Prof. VinayKumar S. N./Mahesh kumar M C
15CVL77	Computer Aided Detailing of Structures	Prof. Vidyadhare CV/Guruprasad
15CVP78	Project Phase I +Project Seminar	Dr.Thippeswamy HN

HOD

HOD, CIVIL ENGG DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062

PRINCIPAL

Principal
City Engineering College,
Bangalore-560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF CIVIL ENGINEERING

CLASS ROOM: C406 **7th Semester (2017 Scheme)**

CLASS TEACHER: Prof. VIDYADHARE C V W. E. F. – 1st OCTOBER 2021

DAY	9:00 to 10:00	10:00 to 11:00		11:15 to 12: 15	12:15 to 1:15		2:00 to 3:00	3:00 TO 4:00	4:00 to 5:00
	I	II		III	IV		V	VI	VII
MON	17CV72		B	17CV742	17CV73	B	17CVL77		17CVL76
TUE		17CV72	R	17CV71	17CV742	R	17CVL77		
WED		17CV73	E		17CV72	E	17CVP78		
THR	17CV742	17CV73	A	17CV72	17CV71	A			
FRI		17CV71	K	17CV751		K	17CVL76		
SAT	17CV751	17CV751							

17CV71	Municipal and Industrial Waste WaterEngineering	Prof. VinayKumar S. N./Mahesh kumar M C
17CV72	Design of RCC and Steel Structures	Prof. Manjunath K. E./Guruprasad
17CV73	Hydrology and Irrigation Engineering	Dr.Thippeswamy HN
17CV742	Design Concepts of Building Services	Prof. Vidyadhare CV
17CV751	Urban Transportation and Planning	Prof. Jayanth K S/Pavan kumar P N
17CVL76	Environmental Engineering Laboratory	Prof. VinayKumar S. N./Mahesh kumar M C
17CVL77	Computer Aided Detailing of Structures	Prof. Vidyadhare CV/Guruprasad
17CVP78	Project Phase I +Project Seminar	Dr.Thippeswamy HN

HOD

HOD, CIVIL ENGG DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062

PRINCIPAL

Principal
City Engineering College,
Bangalore-560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE
Doddakallasandra, Bangalore-560061

ACADEMIC YEAR: 2021-22

DEPARTMENT OF CIVIL ENGINEERING

COURSE PREFERENCE

ODD SEM

Name of the Faculty: Dr. H N THIPPESWAMY

Designation: Professor & HOD

Sl. No	Course Code and Name	Year/Semester
1	18CVP78 - Project Work Phase - 1	4th /7th
2	Internship	4th /7th

Signature of Faculty

Name of the Faculty: Mr. MAHESH KUMAR M C

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1	18CV55 – Municipal Wastewater Engineering	3rd /5th
2	18CV732 - Air Pollution and Control	4th /7th
3	18CV742 - Design Concepts of Building Services	4th /7th

Signature of Faculty

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE
Doddakallasandra, Bangalore-560061

Name of the Faculty: Mr. NISHANTH KUMAR

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1	18CV54 - Basic Geotechnical Engineering	3rd /5th
2	18CVL58 - Concrete and Highway Materials	3rd /5th

Signature of Faculty

Name of the Faculty: Mrs. VIDYADHARE C V

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1	18CV53 - Design of RC Structural Elements	3rd /5th
2	18CV742 - Design Concepts of Building Services	4th /7th
3	18CVL76 - Computer Aided Detailing of Structures	4th /7th

Signature of Faculty

Name of the Faculty: Mr. JAYANTH K S

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1	18CV51 - Construction Management & Entrepreneurship	3rd /5th
2	18CV56 - Highway Engineering	3rd /5th
3	18CVL57 - Surveying Practice	3rd /5th
4	18CVL58 - Concrete and Highway Materials	3rd /5th

Signature of Faculty

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE
Doddakallasandra, Bangalore-560061

Name of the Faculty: Mr. MANJUNATH K E

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1	18CV52 - Analysis of Indeterminate Structures	3rd /5th
2	18CV72 - Design of RCC and Steel Structures	4th /7th
3	18CVL76 - Computer Aided Detailing of Structures	4th /7th

Signature of Faculty

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE
Doddakallasandra, Bangalore-560061

ACADEMIC YEAR: 2021-22 (ODD)

DEPARTMENT OF CIVIL ENGINEERING

COURSE ALLOCATION

ODD SEM

Sl. No	Name of the Faculty	Course Code and Name	Year/ Semester	Signature
1	Dr. H N THIPPESWAMY	18CVP78 - Project Work Phase – 1 Internship	4th /7th 4th /7th	
2	Mr. MAHESH KUMAR M C	18CV55 – Municipal Wastewater Engineering 18CV732 - Air Pollution and Control	3rd /5th 4th /7th	
3	Mr. GURUPRASAD N	18CV52 - Analysis of Indeterminate Structures 18CV72 - Design of RCC and Steel Structures 18CVL76 - Computer Aided Detailing of Structures	3rd /5th 4th /7th 4th /7th	
4	Mr. VINAYKUMAR S N	18CV55 – Municipal Wastewater Engineering 18CV71 - Quality Surveying and Contract Management 18CV732 - Air Pollution and Control 18CVL77 - Geotechnical Engineering Laboratory	3rd /5th 4th /7th 4th /7th 4th /7th	
5	Mr. PAVAN KUMAR	18CV56 - Highway Engineering 18CVL57 - Surveying Practice 18CVL77 - Geotechnical Engineering Laboratory	3rd /5th 3rd /5th 4th /7th	
6	Mr. NISHANTH KUMAR	18CV54 - Basic Geotechnical Engineering 18CVL58 - Concrete and Highway Materials Laboratory	3rd /5th 3rd /5th	
7	Mrs. VIDYADHARE C V	18CV53 - Design of RC Structural Elements 18CV742 - Design Concepts of Building Services 18CVL76 - Computer Aided Detailing of Structures	3rd /5th 4th /7th 4th /7th	
8	Mr. JAYANTH K S	18CV51 - Construction Management & Entrepreneurship 18CV56 - Highway Engineering 18CVL57 - Surveying Practice 18CVL58 - Concrete and Highway Materials	3rd /5th 3rd /5th 3rd /5th 3rd /5th	
9	Mr. MANJUNATH K E	18CV52 - Analysis of Indeterminate Structures 18CV72 - Design of RCC and Steel Structures	3rd /5th 4th /7th	

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

Doddakallasandra, Kanakapura Road, Bangalore – 560061

FACULTY ACADEMIC FILE

Name	: VINAY KUMAR. S.N.
Designation	: ASSISTANT PROFESSOR
VTU Id	: ICECV00007136
Academic Year	: 2021 – 22
Department	: CIVIL ENGINEERING
Branch	: CIVIL ENGINEERING
Semester	: 5th & 7th
Section	: 'A'
Subject Code	: 18CV55, 18CV71 & 18CV732
Subject Name	: MWWE, QS&CM & AP&C

Staff Signature

HOD

HOD, CIVIL ENGG. DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062

Principal

Principal
City Engineering College
Bangalore-560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

DEPARTMENT OF CIVIL ENGINEERING

Prof. VinayKumar S. N.

DAY	9.00 to 10.00	10.00 to 11.00		11.15 to 12.15	12.15 to 1.15		2.00 to 3.00	3.00 to 4.00	4.00 to 5.00
	I	II	B	III	IV	B	V	VI	VII
MON		18CV71	R		18CV732	R		18CVL77	
TUE	18CV71		E	18CV55		E	18CVL77		
WED	18CV732		A	18CV71		A			
THR		18CV732	K		18CV55	K			
FRI		18CV55							
SAT									

S.N.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

HOD, CIVIL ENGG DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062

CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2021-22 (ODD SEM)

DAY	Date	OCTOBER	Date	NOVEMBER	Date	DECEMBER	Date	JANUARY	Date	FEBRUARY
FRI	1	STARTING OF 5th & 7th Semesters								
SAT	2	GANDHI JAYANTI(DH)					1			
SUN	3						2		1	
MON	4		1	KANNADA RAJYOTSAVA(DH)			3		2	
TUE	5		2				4		3	VTU PracticalExams 01.02.2022 To 10.02.2022 5th & 7th Semesters
WED	6	MAHALAYA AMAVASYA(DH)	3	NARAKA CHATURDASHI(DH)	1		5		4	
THU	7		4		2		6		5	
FRI	8		5	DEEPAVALI(DH)	3		7		6	
SAT	9	2ND SATURDAY HOLIDAY	6		4		8	2ND SATURDAY HOLIDAY	7	
SUN	10		7		5		9		8	THIRD INTERNAL ASSESSMENT For 3rd sem
MON	11		8	FIRST INTERNAL ASSESSMENT 5th & 7th Semesters	6	SECOND INTERNAL ASSESSMENT 5th & 7th Semesters	10	THIRD INTERNAL ASSESSMENT 5th & 7th Semesters	9	
TUE	12		9		7		11		10	
WED	13		10		8		12		11	Last Working day of 3rdSemester 19.02.2022
THU	14	AYUDHA PUJA(DH)	11		9		13		12	
FRI	15	VIJAYA DASHAMI(DH)	12		10		14		13	
SAT	16		13	2ND SATURDAY HOLIDAY	11	2ND SATURDAY HOLIDAY	15		14	
SUN	17		14		12		16		15	
MON	18	STARTING OF 3rdSemester	15		13		17		16	
TUE	19	Id Meelad(DH)	16		14		18		17	VTU Theory Exams for 5th & 7th Semesters 11.02.2022 To 25.03.2022
WED	20	VALMIKI JAYANTHI(DH)	17		15		19		18	
THU	21		18		16		20		19	
FRI	22		19		17		21		20	VTU Practical Exams For 3rd sem 21.02.2022 To 04.03.2022
SAT	23	4TH SATURDAY HOLIDAY	20	ALUMNI MEET & GRADUATION DAY	18		22	4TH SATURDAY HOLIDAY	21	
SUN	24		21		19		23		22	
MON	25		22	KANAKA JAYANTHI(DH)	20		24		23	VTU Theory Exams for 3rd sem 07.03.2022 To 25.03.2022
TUE	26		23		21		25		24	
WED	27		24		22		26		25	
THU	28		25		23		27		26	
FRI	29		26		24		28		27	
SAT	30		27	4TH SATURDAY HOLIDAY	25	4TH SATURDAY HOLIDAY	29		28	Commencement of EVEN Semester for 6th & 8th sem is 04.04.2022 and For 4th sem is 11.04.2022
SUN	31		28	FIRST INTERNAL ASSESSMENT 3rd Semester	26	SECOND INTERNAL ASSESSMENT 3rd Semester	30			
MON			29		27		31	Last Working day of 5th & 7th Sem		
TUE			30		28					
WED					29					
THU					30					
FRI					31					

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

B. E. CIVIL ENGINEERING
Choice Based Credit System (CBCS)and Outcome Based Education (OBE)
SEMESTER - V

MUNICIPAL WASTEWATER ENGINEERING

Course Code	**18CV55**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives: This course will enable students to;
1. Understand the various water demands and population forecasting methods.
2. Understand and design different unit operations and unit process in involved in wastewater treatment process
3.Understand the concept and design of various physicochemical treatment units
4. Understand the concept and design of various biological treatment units
5. Understand the concept of various advance waste water and low cost treatment processes for rural areas.

Module-1

Introduction: Need for sanitation, methods of sewage disposal, types of sewerage systems, dry weather flow, wet weather flow, factors effecting dry and wet weather flow on design of sewerage system, estimation of storm water flow, time of concentration flow, numericals.
Sewer appurtenances: Manholes, catch basins, oil and grease traps. P, Q and S traps. Material of sewers, shape of sewers, laying and testing of sewers, ventilation of sewers basic principles of house drainage.

Module-2

Design of sewers: Hydraulic formula to determine velocity and discharge. Self cleansing and non scouring velocity. Design of hydraulic elements for circular sewers for full flow and half flow conditions.
Waste water characteristics: sampling, significance and techniques, physical, chemical and biological characteristics, flow diagram for municipal waste water
Treatment unit operations and process. Estimation of BOD. Reaction kinetics (zero order, 1st order and 2nd order).

Module-3

Treatment of municipal waste water: Screens: types, disposal. Grit chamber, oil and grease removal. primary and secondary settling tanks.
Disposal of effluents: Dilution, self-purification phenomenon, oxygen sag curve, zones of purification, sewage farming, sewage sickness, numerical problems on disposal of effluents. Streeter-Phelps equation.

Module-4

Biological Treatment Process: Suspended growth system - conventional activated sludge process and its modifications. Attached growth system – trickling filter, bio-towers and rotating biological contactors.
Principle of stabilization ponds, oxidation ditch, Sludge digesters(aerobic and anaerobic), Equalization., thickeners and drying beds.

Module-5

Advanced Wastewater Treatment: Need and technologies used. Nitrification and Denitrification Processes, Phosphorous removal. Advance oxidation processes (AOPs), Electro coagulation.
Rural sanitation: Low cost treatment process: Working principal and design of septic tanks for small community in rural and urban areas, two-pit latrines, eco-toilet and soak pits.

Course outcomes: After studying this course, the students will be able to:
1. Select the appropriate sewer appurtenances and materials in sewer network.
2. Design the sewers network and understand the self purification process in flowing water.
3.Deisgn the varies physic- chemical treatment units
4. Design the various biological treatment units
5. Design various AOPs and low cost treatment units.

Question paper pattern:
- The question paper will have ten full questions carrying equal marks.
- Each full question will be for 20 marks.
- There will be two full questions (with a maximum of four sub- questions) from each module.
- Each full question will have sub- question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Textbooks

1. Howard S. Peavy, Donald R. Rowe, George T, "Environmental Engineering" - Tata McGraw Hill, New York, Indian Edition, 2013
2. B C Punmia, "Environmental Engineering vol-II", Laxmi Publications 2nd, 2016
3. Karia G.L., and Christian R.A, "Wastewater Treatment Concepts and Design Approach", Prentice Hall of India Pvt. Ltd., New Delhi. 3rd, Edition, 2017
4. S.K.Garg, "Environmental Engineering vol-II, Water supply Engineering", Khanna Publishers, – New Delhi, 28th edition and 2017

Reference Books

1. CPHEEO manual on sewage treatment, Ministry of Urban Development, Government of India, New Delhi,1999
2. Mark.J Hammer, "Water & Waste Water Technology" John Wiley & Sons Inc., New York, 2008
3. Benefield R.D., and Randal C.W, "Biological Process Design for Wastewater Treatment", Prentice Hall, Englewood Chiffs, New Jersey 2012
4. Metcalf and Eddy Inc, "Wastewater Engineering - Treatment and Reuse", Publishing Co. Ltd., New Delhi, 4th Edition, 2009.

HOD, CIVIL ENGG. DEPT.
CITY ENGINEERING COLLEGE
Doddakallasandra,
BANGALORE - 560 062.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

Doddakallasandra, Bangalore-560061

DEPARTMENT OF CIVIL ENGINEERING

LESSON PLAN FOR ODD SEMESTER FOR ACADEMIC YEAR 2021- 22

Course Title: **MUNICIPAL WASTEWATER ENGINEERING**	Course Code : 18CV55
Internal Marks : 40	End Term Marks : 60
Semester : V	Academic year : 2021-22
Lesson plan Author: Vinaykumar S N	Date :01/10/2021

Course Learning Objectives: This course will enable students to;

1. Understand the various water demands and population forecasting methods.
2. Understand and design different unit operations and unit process in involved in wastewater treatment process
3. Understand the concept and design of various physicochemical treatment units
4. Understand the concept and design of various biological treatment units
5. Understand the concept of various advance waste water and low cost treatment processes for rural areas.

Course Outcomes:

After studying this course, the students will be able to:

1. Select the appropriate sewer appurtenances and materials in sewer network.
2. Design the sewers network and understand the self purification process in flowing water.
3. Deisgn the varies physic- chemical treatment units.
4. Design the various biological treatment units.
5. Design various AOPs and low cost treatment units.

MODULE 1

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
1	1	Introduction to Waste Water Engineering- - Discussion on the syllabus	R, U	CO1
	2	Sewage and Sewerage – Dry weather flow; Storm water flow - Definition and importance	R, U	CO1
	3	Dry weather flow – Determination of storm water Discharge – Calculation of Rainfall run-off-working of problems	R, U	CO1
2	1	Design of Storm water sewers-parameters and principles-Assessment of Discharge	R, U	CO1
	2	Numerical problems on Design of Storm water drains	R, U	CO1
	3	Numerical problems on Design of Storm water drains	R, U	CO1
3	1	Determination of hydraulic elements for design of circular sewers for full flow and half flow conditions	R, U	CO1

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

	2	Material, Shape, Laying and Testing of Sewers,Sewer appurtenances: Manholes, catch basins	R, U	CO1
	3	Oil and grease traps. P, Q and S traps. Ventilation of sewers basic principles of house drainage	R, U	CO1

MODULE 2

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
4	1	Design of Domestic Circular Sewers;	U, A1	CO2
	2	Hydraulic formula to determine velocity and discharge;	U, A1	CO2
	3	Self-cleansing and non-scouring velocity	U, A1	CO2
5	1	Waste water characteristics-Classification - Physical Characteristics	U, A1	CO2
	2	Waste water characteristics – Chemical Characteristics	U, A1	CO2
	3	Chemical Characteristics – continued	U, A1	CO2
6	1	Chemical Characteristics – continued	U, A1	CO2
	2	Biological Characteristics	U, A1	CO2
	3	Biological Characteristics	U, A1	CO2
7	1	Estimation of BOD. Reaction kinetics (zero order, 1st order and 2nd order)	U, A1	CO2
	2	Sampling, significance and techniques	U, A1	CO2
	3	Flow diagram for municipal waste water Treatment unit operations and processes.	U, A1	CO2

MODULE 3

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
8	1	Treatment of municipal waste water – Significance of Various Treatment Units	R, U, A1	CO3
	2	Screens: types, disposal. Grit chamber; Oil and grease removal	R, U, A1	CO3
	3	Sedimentation - Theory of Settling - Primary and secondary settling tanks	R, U, A1	CO3
9	1	Disposal of effluents: Methods - on-land. In to water body – Dilution factor	R, U, A1	CO3
	2	Self-purification phenomenon, oxygen sag curve – Different Zones of Purification	R, U, A1	CO3
	3	Streeter-Phelps equation; Working of Problems	R, U, A1	CO3
10	1	Numerical problems on disposal of effluents.	R, U, A1	CO3
	2	Numerical problems on disposal of effluents.	R, U, A1	CO3
	3	Sewage farming, Sewage sickness	R, U, A1	CO3

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

MODULE 4

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
11	1	Biological Treatment Process: Aerobic and Anaerobic Reactions – Suspended Growth Systems – Conventional Activated Sludge Process (ASP)	U, A1, A2	CO4
	2	Modifications of ASP	U, A1, A2	CO4
	3	Working of Problems on Activated sludge process	U, A1, A2	CO4
12	1	Attached growth system – Principles of Design of Trickling filter	U, A1, A2	CO4
	2	Problems on Design of Trickling Filters	U, A1, A2	CO4
	3	Principle of Working of Bio-towers and Rotating Biological Contactors	U, A1, A2	CO4
13	1	Stabilization Ponds –Design of Oxidation Pond and Oxidation Ditch	U, A1, A2	CO4
	2	Flow Equalization -Sludge digesters - aerobic and anaerobic- thickeners and Sludge drying beds.	U, A1, A2	CO4
	3	thickeners and Sludge drying beds.	U, A1, A2	CO4

MODULE 5

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
14	1	Advanced Wastewater Treatment Need and technologies used. Nitrification and De-nitrification Processes	R, U, A1, A2	C05
	2	Phosphorous removal.	R, U, A1, A2	C05
	3	Advance oxidation processes (AOPs), Electro coagulation.	R, U, A1, A2	C05
15	1	Rural sanitation: Low cost treatment processes	R, U, A1, A2	C05
	2	Working principal and design of septic tanks for small community in rural and urban area	R, U, A1, A2	C05
	3	Design Principles and Working of numerical Problems on Design of Septic Tanks	R, U, A1, A2	C05
16	1	Two-pit latrines	R, U, A1, A2	C05
	2	Eco-toilet and	R, U, A1, A2	C05
	3	soak pits.	R, U, A1, A2	C05

Bloom's Taxonomy Level

R-Remembering, U-Understanding, A1-Applying, A2-Analysing, E-Evaluating, C-Creating

LIST OF TEXT BOOKS

1. Howard S. Peavy, Donald R. Rowe, George T. "Environmental Engineering" - Tata McGraw Hill, New York, Indian Edition, 2013
2. B C Punmia, "Environmental Engineering vol-II", Laxmi Publications 2nd, 2016
3. Karia G.L., and Christian R.A, "Wastewater Treatment Concepts and Design Approach", Prentice Hall of India Pvt. Ltd., New Delhi. 3rd, Edition, 2017
4. S.K.Garg, "Environmental Engineering vol-II, Water supply Engineering", Khanna Publishers, – New Delhi, 28th edition and 2017

LIST OF REFERENCE BOOKS

1. CPHEEO manual on sewage treatment, Ministry of Urban Development, Government of India, New Delhi,1999
2. Mark.J Hammer, "Water & Waste Water Technology" John Wiley & Sons Inc., New York, 2008
3. Benefield R.D., and Randal C.W, "Biological Process Design for Wastewater Treatment", Prentice Hall, Englewood Chiffs, New Jersey 2012
4. Metcalf and Eddy Inc, "Wastewater Engineering - Treatment and Reuse", Publishing Co. Ltd., New Delhi, 4th Edition, 2009.

Signature of Faculty

Signature of HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

1	C	E							

CITY ENGINEERING COLLEGE

Doddakallasandra, Bangalore-560061

DEPARTMENT OF CIVIL ENGINEERING

FIRST INTERNAL TEST

V SEM | **SUBJECT: MUNICIPAL WASTEWATER ENGINEERING** | **DATE: 10/11/2021**

MAX MARKS : 50 | **SUB CODE:18CV55** | **TIME: 10.00 TO 11.30**

Note: Answer all Questions selecting any ONE FULL question from each part.

Q No.	Questions	Marks	CO's	BT Level
	PART -A			
1	Explain briefly the important features of the different system of sewerage. Also, state their merits and demerits.	10	CO1	L1, L2
	Or			
2	List the various types of low cost treatment methods and explain anyone with a neat sketch.	10	CO1	L1, L2
	PART -B			
3	What do you understand by D.W.F? Discuss in brief various factors affecting D.W.F.	10	CO1	L1, L2
	Or			
4	The main sewer was designed for an area of 50km^2. Density of population of the town is 200 persons/hectare. The Avg. flow is 250lpcd. The peak discharge is 1.5 times more than the average flow. Rainfall equivalent of 8mm in 24 hours all of which are runoff. a) What should be the capacity of the sewer in m^3/sec b) Find the minimum velocity and gradient required to transport sewage containing wastes of 1mm diameter through a sewer of 35cm diameter, specific gravity of particles is 2.65 and the values of 'k'= 0.66 and F = 0.03	10	CO2	L2, L3
	PART - C			
5	What are the essential requirements of good sewers? Explain the different methods of ventilation of sewers.	10	CO1	L1, L2
	Or			

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

6	Design a circular sewer running half full to carry the sewage generated from a town with the following data: population is 150000, rate of water supply is 135lpcd, peak flow rate is 2, slope of sewer is 1 in 400, n is 0.013. Check the velocity developed.	10	CO2	L2, L3

PART -D

7	Define sewer appurtenances. List the various types of sewer appurtenances and explain any two with a neat sketch.	10	CO1	L1, L2

Or

8	A district consists of 20% area with runoff coefficient 0.9, 25% area with a coefficient of 0.7, 30% of area with 0.45, 15% of area with 0.25 and the remaining with a runoff coefficient of 0.05, compute the storm discharge of the district whose area is 2.4 hectares and if the maximum intensity of rainfall is 6.25mm/hr.	10	CO2	L2, L3

PART -E

9	What are the basic principles of house drainage system. Draw a typical plan showing house drainage connections.	10	CO1	L2, L3

Or

10	A city of 300000 populations, 60000 hectares receives water supply at 150lpcd, 80% of which is returned as spent water. Data gathered in the city indicates: Avg. impervious factor is 0.58, time of concentration is 18min, infiltration rate is 9600lit/day/hectare and i =1500/t+32. Find out the dry and wet weather flow rate and their ratio.	10	CO2	L2, L3

Bloom Taxonomy Levels (BTL):

L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating

Course outcome's (CO's):

CO1: Select the appropriate sewer appurtenances and materials in sewer network.

CO2: Design the sewers network and understand the self purification process in flowing water.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF CIVIL ENGINEERING

SCHEME FOR VALUATION

Internal Test 01

Semester & Section: 5th 'A' MW10E-(18CV55) Date: 10/11/21

Question No.	Details of the Answer	Marks Total Distribution	Total Marks
(01)	Different system of sewerage →	06	
	Merits →	02	10
(A)	Demerits →	02	
(2)	Listing of low cost treatment methods →	02	
	Explanation of anyone with sketch →	08	10
(3)	Explanation of D.W.F →	04	
(B)	Factors affecting D.W.F →	06	10
(4)	Avg flow = 2.89 m^3/s →	02	
	Max flow = 4.34 m^3/s →	01	
	Storm water flow = 4.629 m^3/s →	02	10
	Capacity of sewers = 8.969 m^3/s →	01	
	Velocity of sewers = 0.51 m/s →	02	
	Slope of sewers = 1 in 1040 →	02	
(5)	Requirements of good sewers →	04	
	Ventilation of Sewers →	01	10
(C)	Methods of Ventilation →	05	

Staff

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

HOD

HOD, CIVIL ENGG. DEPT.
CITY ENGINEERING COLLEGE

Question No.	Details of the Answer	Marks Total Distribution	Total Marks
(6)	$Q = 0.468 m^3/s$ →	02	10
	$V = 1.526 d^{2/3}$ →	02	
	$d = 0.911 m$ →	02	
	$v = 1.435 m/s$ →	02	
	Conclusion →	02	
(7) (1)	Sewer Appurtenances →	02	10
	Types of sewer appurtenances →	01	
	Explanation of any two with sketch →	07	
(8)	$C = \frac{\Sigma CA}{\Sigma A}$ →	02	10
	$C = 0.5325$ →	03	
	$Q = CIA/360$ →	02	
	$Q = 0.022 m^3/s$ →	03	
(9) (E)	Basic principals of home drainage system →	04	10
	Typical plan showing connections →	06	
(10)	$Q_1 = 4.16 m^3/s$ →	02	10
	$I = 30 mm/hr$ →	02	
	$Q_2 = 2900 m^3/s$ →	02	
	$I.R = 6.67 m^3/s$ →	01	
	Storm flow $= 2893.33 m^3/s$ →	01	
	$\therefore$ DWF/WWF $= 1 : 695.51$ →	02	

Staff S.N.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

HOD

HOD, CIVIL ENGG. DEPT.
CITY ENGINEERING COLLEGE

CITY ENGINEERING COLLEGE

Doddakallasandra, Bangalore-560061

DEPARTMENT OF CIVIL ENGINEERING

ASSIGNMENT QUESTIONS FOR IST INTERNALS

Vth sem

Sub: MUNICIPAL WASTE WATER ENGINEERING **Code: 18CV55**

1. Explain briefly the important features of the different system of sewerage. Also, state their merits and demerits.
2. Differentiate between the following:
   I. Sullage and sewage
   II. Raw sewage and septic sewage
   III. Dry weather flow and wet weather flow
   IV. Lateral sewer and outfall sewer
3. Explain the necessity and importance of sewerage system.
4. Explain the rational method of estimation of storm water.
5. Explain the terms:
   I. Self cleansing velocity and non scouring velocity
   II. Infiltration and exfiltration
6. List the desirable character of sewer material. List the sewer material commonly used.
7. Briefly explain how the sewers are tested for leakage after laying.
8. Describe: i) Conservancy system ii) Water carriage system. And what are the relative advantages and disadvantages of two systems?
9. Discuss the relative merits and demerits of the separate and combined system of sewage and give the conditions favorable for the adoption of each one of them.
10. What do you understand by D.W.F? Discuss in brief various factors affecting D.W.F.
11. What are the essential requirements of good sewers? Explain the different methods of ventilation of sewers.
12. Explain the various shapes of sewers with a neat sketch.
13. List the various types of low cost treatment methods and explain anyone with a neat sketch.
14. Explain the different methods of ventilation of sewers.
15. Define sewer appurtenances. List the various types of sewer appurtenances and explain any two with a neat sketch.
16. What are the basic principles of house drainage system. Draw a typical plan showing house drainage connections.
17. Mention the different formulas used to calculate hydraulic velocity. Derive the equation for hydraulic mean depth for circular sewer for full flow condition.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

18. The main sewer was designed for an area of 50km^2. Density of population of the town is 200 persons/hectare. The Avg. flow is 250lpcd. The peak discharge is 1.5 times more than the average flow. Rainfall equivalent of 8mm in 24 hours all of which are runoff.

a) What should be the capacity of the sewer in m^3/sec

b) Find the minimum velocity and gradient required to transport sewage containing wastes of 1mm diameter through a sewer of 35cm diameter, specific gravity of particles is 2.65 and the values of 'k'= 0.66 and F = 0.03

19. A certain district of a city has a projected population of 50000 residing over an area of 40 Hectares. Find the design of discharge for the sewer line, for the following data.

I. Rate of water supply = 200 lpcd
II. Average impermeability coefficient for the entire area = 0.3
III. Time of concentration = 50minutes.

The sewer line is to be designed for a flow equivalent to the WWF plus twice the DWF. Take sewage generated as equal to 75% of water supplied. Use U.S ministry of health formula.

20. A district consists of 20% area with runoff coefficient 0.9, 25% area with a coefficient of 0.7, 30% of area with 0.45, 15% of area with 0.25 and the remaining with a runoff coefficient of 0.05, compute th storm discharge of the district whose area is 2.4 hectares and if the maximum intensity of rainfall is 6.25mm/hr.

21. Design a circular sewer to serve a residential suburb of a city with the following data:

I. Area of the suburb = 50hectares
II. Population = 6000 persons
III. Avg rate of water supply = 200lpcd
IV. Max flow =3 times avg flow
V. Subtraction allowance = 20%
VI. Critical design rainfall intensity = 40mm/hr
VII. Avg ground slope = 1 in 1000
VIII. Coefficient of runoff = 0.45
IX. Manning's (n) = 0.012

22. A city of 300000 populations, 60000 hectares receives water supply at 150lpcd, 80% of which is returned as spent water. Data gathered in the city indicates: Avg. impervious factor is 0.58, time of concentration is 18min, infiltration rate is 9600lit/day/hectare and $i = 1500/t+32$. Find out the dry and wet weather flow rate and their ratio.

23. Calculate the velocity of flow in a sewer of dia of 100cm laid in a slope of 1 in 1000. What will be the discharge when running half full, assume suitable data if necessary.

24. Design a circular sewer running half full to carry the sewage generated from a town with the following data: population is 150000, rate of water supply is 135lpcd, peak flow rate is 2, slope of sewer is 1 in 400, n is 0.013. Check the velocity developed.

CITY ENGINEERING COLLEGE

Doddakallasandra, Bangalore-560061

DEPARTMENT OF CIVIL ENGINEERING

ASSIGNMENT QUESTIONS FOR IIND INTERNALS

V sem

Sub: MWWE **Code: 18CV55**

1. Discuss in detail the process of deoxygenation and reoxygenation with respect to self purification of natural waters with a neat sketch. **(Dec 15/Jan 16)**
2. What is self purification phenomenon of streams? Discuss in brief, the various natural forces effecting self-purification. **(June/July 16, Dec 13/Jan 14, June/July 2015)**
3. Explain wastewater disposal into sea. **(June/July 2015)**
4. Explain the different zones of self purification. **(June /July 14)**
5. Write short notes on: i) Sewage farming ii) Oxygen sag curve. **(Dec 14/Jan 15)**
6. List the effluent disposal standards for land, surface water and ocean. **(June/July 15)**
7. Partially treated town sewage 1.5 MLD having a BOD of 100 mg/l is to be discharged into a stream. The stream water has a BOD of 10 mg/lt. If the final BOD of the stream is not to exceed 30 mg/l, what should be the minimum flow of the stream? **(Dec 14/Jan 15)**
8. 100 m3/sec of city sewage is discharged in a river which is fully saturated with oxygen and flows at a minimum rate of 1250 m3/sec, with a minimum velocity of 0.15 m/sec. If the 5-day BOD of the sewage is 260 mg/l, find where the critical DO will occur in the river. Take KD = 0.11 d-1, f = 4.0. Also ultimate BOD is 125% of 5-d BOD of the mixture of sewage and river water. DO saturated for river water = 9.17 mg/l. **(June/July 2015)**
9. A city with a population of one lakh and a sewage flow 125lpcd is located on a stream with a rate of flow of 0.7m^3/sec. The BOD of sewage is 200mg/l. The DO and BOD content of the stream above the outfall sewer are 7mg/l and 1mg/l respectively.
   a) How many kg of oxygen per day are available above the outfall.
   b) What is the total kg of BOD per day in the stream just below the outfall (assuming no oxidation)? Express the total BOD in mg/l.
10. The sewage of a town is being discharged into a river. The city of sewage is 5MLD and its BOD is 300mg/l. If the flow of the river is 100lit/sec and if BOD of river water is 7mg/l.
    a) Find the BOD of the diluted sewage.
    b) What should be the discharge of river if it is desired to reduce the BOD of mixture to 30mg/l?

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

11. A town of 60000 populations has water supply at 140lpcd. Assuming no infiltration and 80% water reaching the sewer, calculate the area of land required for broad irrigation with 50% reserve. Rate of loading is 140000 lit/hec/day.
12. Write short notes on: i) Sewage sickness ii) Reoxygenation curve
13. Write short notes on: i) Disposal by dilution ii) House drainage sanitary fittings
14. Draw a flow diagram of a municipal sewage treatment plant including sludge digestion. Give the removal of important polluting parameters by each of the treatment units.
15. Explain the importance of providing racks and screens in a waste-water treatment plant. Draw a neat sketch of a bar screen and explain the loss of head through the screen.
16. Explain the functioning of screens and Grit chamber in the treatment of municipal wastewater.
17. What are skimming tanks? Explain with a neat sketch.
18. Design a rectangular sedimentation tank for a population of 90,000 thousand, with an assured water supply of 140 lpcd, 80% of which reaches the treatment plant. Assume peak factor as 1.2, flow velocity = 0.3 m/min. Check for over flow rate.
19. Design a grit chamber for a town having a population of one lakh. Assume suitable data necessary.
20. Design a continuous flow rectangular primary sedimentation tank fitted with mechanical sludge cleaning equipment for treating the sewage from a city having a population of 80000 persons which has an assured water supply rate of 100lpcd. Assume the maximum flow to be 1.4 times the average flow. The necessary design parameters may be assumed. Sketch the designed sedimentation tank.
21. Design a circular settling tank, for primary treatment of domestic sewage for a flow of 10MLD. Assume suitable values of hydraulic retention time and surface loading rate suitably.
22. The sewage flow from a town is 6 million liters per day. Find the diameter and depth of a primary sedimentation tank with a detention period of 2hrs and overflow rate of 1500 liters per square meter per hr. What would be the weir loading for the tank designed? Is it within the permissible limits?
23. Design a circular sedimentation tank for the primary treatment of sewage at 13.5 million liter per day. Check its surface loading.
24. Explain sedimentation aided with coagulation with merits and demerits in sewage treatment.
25. Explain the terms BOD and COD and their importance with respect to environmental pollution. (Dec 15/Jan 16)
26. Explain COD and its relation with BOD. (June/July 2015)
27. Explain the physical and chemical characteristics of sewage. (June/July 16)
28. Define BOD. Deduce the expression for first stage BOD. (June/July 2015)
29. Clearly bring out the differences between the following terms: i) Aerobic and anaerobic decomposition ii) BOD and COD iii) Carbonaceous BOD and Nitrogenous BOD. (June/July 13)
30. If 6 days 15°C BOD of a sewage sample is 250 mg/l. What will be its 10 days 25°C BOD.

31. The BOD of a sewage sample incubated for 5 days at 30°C has been found to be 110 mg/l. Calculate the BOD_5 at 20°C assuming $K_{(20)}$ as 0.1/day.
32. The BOD of a sewage sample incubated for 1 day at 30°C has been found to be 110 mg/l. What will be its 5 day 20°C BOD. Assume $K_{(20)}$ as 0.1/day.
33. Explain BOD and discuss the advantages and limitation of BOD.(Dec14/Jan15)
34. What is meant by BOD and its determination in the laboratory with their standard equations? (Dec 15/Jan 16)

CITY ENGINEERING COLLEGE

Doddakallasandra, Bangalore-560061

DEPARTMENT OF CIVIL ENGINEERING

ASSIGNMENT QUESTIONS FOR III[rd] INTERNALS

V[th] sem

Sub: MWWE **Code: 18CV55**

1. Explain the concept of aerobic and anaerobic activity with respect to sewage treatment. (Dec 15/Jan16)
2. Explain the biological treatment techniques for treating waste-water. (June/July 2016)
3. What are HRTF's? Explain importance of recirculations and its effect on the efficiency of HRTF's. (June/July 2015)
4. Design suitable dimensions of a circular trickling filter units for treating 5 million liters of sewage per day. The BOD of sewage is 150 mg/l.
5. What is meant by activated sludge? Describe with neat sketches the treatment of sewage by activated sludge process. (Dec 15 /Jan16, June/July 14)
6. Explain with a neat sketch, the working of trickling filter. (June/July 15, Dec 15 /Jan16)
7. Differentiate between the following terms: i) Sludge volume index and bulking of sludge ii) Suspended and attached growth process. (Dec 14/Jan 15)
8. Discuss the effect of recirculation in filters with figure. (Dec 15/Jan 16)
9. Determine the depth of the filter, volume of the filter media and the efficiency of treatment of a standard the trickling filter, from the following data : Quantity of settled - 4.5 $x10^6$ l/day Sewage, BOD of raw sewage - 150 mg/l, Rate of organic loading - 159 gms/m3/day, Rate of surface loading - 2000 l/m2/day (Dec 14/Jan 15).
10. An average operating data for conventional activated sludge treatment plant is as follows: Waste water flow : 35000 m3/sec, Volume of aeration tank : 10000 m^3, Effluent BOD : 20 mg/1, Effluent suspended solids : 30 mg/1, Influent BOD : 250 mg/l, Mixed liquor suspended solids : 2500 mg/1, Waste sludge suspended solids : 9700 mg/1, Quantity of waste sludge : 220 m3/d. Based on the above information, determine i) Aeration period (hr) ii) Food to microorganism ratio (F/m) (kg BOD per day/kg MLSS) iii) Percentage efficiency of BOD removal iv) Sludge age (days). (Dec 15/Jan16)
11. . Design a low rate filter to treat 6.0 Mld of sewage of BOD of 210 mg/l. The final effluent should be 30 mg/l and organic loading rate is 320 g/m3/d. (June/July14)
12. The MLSS concentration in an aeration tank is 2000mg/l and the sludge volume after 30 minutes of settling in a 1000 ml cylinder is 176 ml. calculate: i. SVI ii. SDI iii. Required return sludge ratio and iv. SS concentration in the re- circulated sludge. (June/July 2015)

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

13. What is a sludge gas? What is its typical composition? what are the uses of sludge gas? What do you understand by the term "Low Cost Waste Treatment" (Dec 15/Jan 16)
14. Explain the stages of anaerobic sludge digestion. (Dec15/Jan16, June/July 2015)
15. The flow of sewage from a town is 6000 m^3/d with a suspended solids concentration of 300 mg/l, of which 65% is removed in primary settling tanks. If the sludge is digested in a digestion tank. Find the volume of digested sludge by using following data: moisture content of digested sludge is 92%, solids lost during digestion is 40% & specific gravity of digested sludge is 1.02.
16. Discuss the importance of reuse and recycling of sewage with their merits and demerits in this modernized society. (Dec 14/Jan 15)
17. Design a septic tank for a small colony of 200 persons provided with a water supply of 135 lpcd. Assume the necessary data for the design. The data available are: MDD is twice the ADD, 80% of water supply becomes spent, detention time of 24 hours, length to breadth ratio is 1:3. Draw a line diagram showing designed dimensions. (Dec 14/Jan15)
18. What do you understand by advanced wastewater treatment? How is it different from the conventional treatment? Give, in a tabular form, important AWT processes.
19. Draw a neat sketch of septic tank with soak pit, Write the design criteria required for septic tank.
20. Discuss in brief the biological and chemical methods of removal of phosphorous from wastewater.
21. Write a short note on: a) eco toilet. b) two pit latrines.
22. Explain Nitrification & Denitrification process.
23. Explain Electro coagulation process.

Year : 2021 - 2022 Semester : Odd / Even

Name of the Teacher : VINAYKUMAR S.N./MAHESHKUMAR H.C

Designation : ASSISTANT PROFESSOR

Department : CIVIL ENGINEERING

Sem/ Branch	Subject Code	Subject
1. 5th	18CV55	Municipal Wastewater Engineering
2. 7th	18CVL77	Geotechnical Engineering Laboratory
3.		

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff				
HOD				
Principal				

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

18CV55

ATTENDANCE

Sl. No.	Reg. No	Name	01/10	05/10	07/10	12/10	20/10	22/10	26/10	28/10	29/10	02/11	10/11	11/11	12/11	16/11	18/11	23/11	25/11	26/11	30/11	02/12	03/12	% Attn.	Test Marks 1	2	3	4	5	Sessional Marks	Remarks
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21								
1	1CE20CV003	Chakravarthy CM	1	2	3	4	5	A	6	7	8	9	10	11	12	13	14	15	16	17	18	A	19	94	36	27	28	19	10	29	
2	1CE20CV004	Apoorva C	A	1	2	3	4	5	6	7	8	9	10	11	12	13	14	A	15	16	17	18	19	92	33	34	33	20	10	30	
3	003	Ravikiran S	1	A	3	4	5	6	A	7	8	9	10	11	12	13	14	15	16	17	A	18	19	92	45	37	38	24	10	34	
4	004	Veena C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	96	40	40	39	24	10	34	
5	1CE20CV400	Rajashekar Prasad V	A	1	2	3	4	5	6	7	8	A	9	10	11	12	13	14	15	16	A	17	18	90	17	25	25	14	09	23	
6																															
7																															
8																															
9																															
10																															
11																															
12																															
13																															
14																															
15																															
16																															
17																															
18																															
19																															
20																															
21																															
22																															
23																															
24																															
25																															
		No of Abs	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	
		Initials																													

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560 061

ESSMENT

CITY ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CIRCULAR

Ref. No: CEC/CSE/DAC/2021-2022/02 **Date: 21-03-2022**

All the members of Department Advisory Committee are informed to attend a meeting which will be held as follows

Date: 26-03-22
Time: 03.30 PM
Venue: LAB C108

Agenda:

- Certification course for 3rd year
- Organizing workshop for final year
- Conduction of Project Exhibition
- Industrial Visit
- Conduction of guest lectures/ workshops

Mr. Vivekavardhana Reddy

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Department Advisory Committee Meeting

Date: 26-03-2022
Time: 03.30 PM
Venue: Room No. C104

DAC Members Present:

Sl. No	Member Name	Designation	Role	Sign
1	Mr. Vivekavardhana Reddy	HOD	Convenor	
2	Dr. Nandakumar A N	Professor	Member	
3	Dr. Y S Kumaraswamy	Professor	Member	
4	Dr. Sowmya Naik P T	Professor	Co-Convenor	
5	Mrs. Ambika P R	Assistant Professor	Member	
6	Mrs. Laxmi M C	Assistant Professor	Member	
7	Mr. Girish G A	Assistant Professor	Member	
8	Mrs. Archana Bhat	Assistant Professor	Member	
9	Mr. Vinodh Kumar S	Assistant Professor	Member	
10	Mr. Narasimha Prasad K L	Project Manager, Accenture Services Pvt. Ltd	Alumni (Industry Expert)	
11	Mr. Devraj K	Founder & CEO, EtherScale	Alumni	

The Department Advisory Committee meeting was conducted at Department of CSE, on 26th March 2022, at 03:30 PM.

Agenda of the Meeting:

- Conducting Certification courses
- Organizing workshop for final year
- Conduction of Project Exhibition
- Faculty development program
- Conduction of guest lectures/ workshops

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

Minutes of Meeting:

In the Department Advisory Committee meeting, an overview of the department was presented, emphasizing student achievements, result analysis, and faculty accomplishments. The members discussed various suggestions for improvement and reviewed the meeting agenda.

The Committee proposed the following items for inclusion in the agenda:

- A certificate course on Blockchain has been recommended, aiming to not only enhance programming skills but also to deepen students' understanding of this advanced concept.
- A workshop on Drone Technology has been planned specifically for final-year students.
- Second-year students are encouraged to participate in technical activities and to attend guest lectures or seminars to broaden their knowledge.
- A project exhibition has been proposed, offering final-year students a platform to showcase their work.
- Dr. Y S Kumaraswamy proposed a faculty development program, where professors and faculty members engaged in research can present their topics.
- To keep students and faculty updated with current technologies, the committee suggested organizing workshops, guest lectures, and hands-on sessions.

Mr. Vivekavardhana Reddy

HOD & Convenor

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Revised - Academic Calendar for EVEN Semester of UG programs for the year 2021-22

	VI semester B.E./B.Tech.	VI semester B.Arch.	VI semester B.Plan	VIII sem B.Arch	IV Semester B.Arch.	IV semester B. Plan	II semester B.E./B.Tech.	II semester B.Arch/B.Plan
Commencement of EVEN Semester	04.04.2022	04.04.2022	04.04.2022	04.04.2022	11.04.2022	11.04.2022	06.06.2022	06.06.2022
Last Working day of EVEN Semester	16.07.2022	16.07.2022	16.07.2022	23.07.2022	23.07.2022	23.07.2022	09.09.2022	09.09.2022
Practical/Viva-Examination	18.07.2022 To 29.07.2022	18.07.2022 To 29.07.2022	18.07.2022 To 29.07.2022	25.07.2022 To 30.07.2022	25.07.2022 To 30.07.2022	25.07.2022 To 30.07.2022	01.10.2022 To 10.10.2022	01.10.2022 To 10.10.2022
Theory Examinations	01.08.2022 To 20.08.2022	01.08.2022 To 20.08.2022	01.08.2022 To 20.08.2022	01.08.2022 To 20.08.2022	01.08.2022 To 20.08.2022	01.08.2022 To 20.08.2022	12.09.2022 To 30.09.2022	12.09.2022 To 30.09.2022
Internship	21.08.2022 To 10.09.2022	---	21.08.2022 To 10.09.2022		---	---	11.10.2022 To 30.10.2022	
Commencement of ODD semester	12.09.2022	12.09.2022	12.09.2022	01.09.2022	12.09.2022	12.09.2022	31.10.2022	31.10.2022

Please Note:

- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by MHRD/UGC/AICTE/State Government.
- Academic Calendar is also applicable for **Autonomous Colleges.** In case any changes are to be effected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.

22/8/2022

REGISTRAR

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2021-22 (EVEN SEM)

DAY	Date	APRIL	Date	MAY	Date	JUNE	Date	JULY	Date	AUGUST	Date	SEPTEMBER
THU											1	
FRI	1						1				2	
SAT	2	UGADHI					2				3	
SUN	3		1	LABOURS DAY			3				4	
MON	4	STARTING OF 6th& 8th Semesters	2				4	VTU Theory Exams for8th Semesters 04.07.2022 To 20.07.2022	1	VTU Theory Exams for 6th&8th Semesters 01.08.2022 To 20.08.2022	5	
TUE	5		3	BASAVA JAYANTHI / RAMZAN			5		2		6	
WED	6		4		1	2 Days workshop for 4th Semester	6	THIRD INTERNAL ASSESSMENT 6th Semester	3		7	
THU	7		5		2		7		4		8	
FRI	8		6	Dept. Technical/Cultural Activities	3	Dept.Technical/Cultural Activities	8		5		9	
SAT	9	2ND SAT HOLIDAY	7		4		9	2ND SAT HOLIDAY	6		10	2ND SAT HOLIDAY
SUN	10		8		5		10		7		11	
MON	11		9	FIRST INTERNAL ASSESSMENT 6th&8th Semesters	6	SECOND INTERNAL ASSESSMENT 6th&8th Semesters	11	Lab internals for 6thSem	8		12	
TUE	12		10		7		12		9	MOHARAM	13	
WED	13		11		8		13		10		14	
THU	14	AMBEDKAR / MAHAVIR J	12		9		14		11		15	
FRI	15	GOOD FRIDAY	13	Dept. Technical/Cultural Activities	10	Dept. Technical/Cultural Activities	15	Dept. Technical/Cultural Activities	12		16	
SAT	16		14	2ND SAT HOLIDAY	11	2ND SAT HOLIDAY	16	Last Working day of 6th Sem16.07.2022 Alumni meet	13	2ND SAT HOLIDAY	17	
SUN	17		15		12		17		14		18	
MON	18	18th to 22nd **Technical Seminar presentation**	16	2 days' Workshop for 6th Semester	13	STARTING OF 1st Semester	18	VTU Practical Exams 6th Semesters 18.07.2022 To 29.07.2022	15	INDEPENDENSE DAY	19	
TUE	19		17		14		19		16		20	
WED	20		18		15	15th to 17th 8th semester **Project Phase III presentation**	20		17		21	
THU	21		19		16		21		18		22	
FRI	22		20	Workshop On **"Drone Technology"** for 8th Semester	17	Industrial visit for 6th Semester	22	GRADUATION DAY	19	**Technical Talk** for 4th semester	23	
SAT	23	4th SAT HOLIDAY	21		18		23	4th SAT HOLIDAY	20		24	4th SAT HOLIDAY
SUN	24		22		19		24	Project, Internship Viva .07.2022 To 30.07.2022	21		25	
MON	25		23	23rd to 27th 8th semester **Internship presentation**	20	Cultural, Sports Competitions, Ethnic Day ANNUAL DAY	25		22	Commencement of ODD Sem 22.08.2022	26	
TUE	26	26th to 28th 8th semester **Project Phase II presentation**	24		21		26		23		27	
WED	27		25		22		27		24		28	
THU	28		26		23		28		25		29	
FRI	29		27	Dept. Technical/Cultural Activities	24		29	Dept. Technical/Cultural Activities	26		30	
SAT	30		28	4th SAT HOLIDAY	25	4th SAT HOLIDAY	30		27	4th SAT HOLIDAY		
SUN			29		26	THIRD INTERNAL ASSESSMENT 8th Semester	31	GANESHA FESTIVAL	28			
MON			30		27				29			
TUE			31	**Industrial Visit** for 4th Semester	28				30			
WED					29	8TH SEMESTER **"Project Exhibition"**			31			ATTESTED COPY
THU					30	Last Working day of 8th semester						PRINCIPAL CITY ENGINEERING COLLEGE Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF CSE- ACADEMIC CALENDAR 2021-22 (EVEN SEM)

DAY	Date	APRIL	Date	MAY	Date	JUNE	Date	JULY	Date	AUGUST	Date	SEPTEMBER
THU											1	
FRI	1						1				2	
SAT	2	UGADHI					2				3	
SUN	3		1	LABOURS DAY			3				4	
MON	4	STARTING OF 6th& 8th Semesters	2				4	VTU Theory Exams for8th Semesters 04.07.2022 To 20.07.2022	1	VTU Theory Exams for 6th&8th Semesters 01.08.2022 To 20.08.2022	5	
TUE	5		3	BASAVA JAYANTHI / RAMZAN			5		2		6	
WED	6		4		1	2 Days workshop for 4th Semester	6	THIRD INTERNAL ASSESSMENT 6th Semester	3		7	
THU	7		5		2		7		4		8	
FRI	8		6	Dept. Technical/Cultural Activities	3	Dept.Technical/Cultural Activities	8		5		9	
SAT	9	2ND SAT HOLIDAY	7		4		9	2ND SAT HOLIDAY	6		10	2ND SAT HOLIDAY
SUN	10		8		5		10		7		11	
MON	11		9	FIRST INTERNAL ASSESSMENT 6th&8th Semesters	6	SECOND INTERNAL ASSESSMENT 6th&8th Semesters	11	Lab internals for 6thSem	8		12	
TUE	12		10		7		12		9	MOHARAM	13	
WED	13		11		8		13		10		14	
THU	14	AMBEDKAR / MAHAVIR J	12		9		14		11		15	
FRI	15	GOOD FRIDAY	13	Dept. Technical/Cultural Activities	10	Dept. Technical/Cultural Activities	15	Dept. Technical/Cultural Activities	12		16	
SAT	16		14	2ND SAT HOLIDAY	11	2ND SAT HOLIDAY	16	Last Working day of 6th Sem16.07.2022 Alumni meet	13	2ND SAT HOLIDAY	17	
SUN	17		15		12		17		14		18	
MON	18	18th to 22nd **Technical Seminar presentation**	16	2 days' Workshop for 6th Semester	13	STARTING OF 1st Semester	18	VTU Practical Exams 6th Semesters 18.07.2022 To 29.07.2022	15	INDEPENDENSE DAY	19	
TUE	19		17		14		19		16		20	
WED	20		18		15	15th to 17th 8th semester **Project Phase III presentation**	20		17		21	
THU	21		19		16		21		18		22	
FRI	22		20	Workshop On **"Drone Technology"** for 8th Semester	17	Industrial visit for 6th Semester	22	GRADUATION DAY	19	**Technical Talk** for 4th semester	23	
SAT	23	4th SAT HOLIDAY	21		18		23	4th SAT HOLIDAY	20		24	4th SAT HOLIDAY
SUN	24		22		19		24	Project, Internship Viva .07.2022 To 30.07.2022	21		25	
MON	25		23	23rd to 27th 8th semester **Internship presentation**	20	Cultural, Sports Competitions, Ethnic Day ANNUAL DAY	25		22	Commencement of ODD Sem 22.08.2022	26	
TUE	26	26th to 28th 8th semester **Project Phase II presentation**	24		21		26		23		27	
WED	27		25		22		27		24		28	
THU	28		26		23		28		25		29	
FRI	29		27	Dept. Technical/Cultural Activities	24		29	Dept. Technical/Cultural Activities	26		30	
SAT	30		28	4th SAT HOLIDAY	25	4th SAT HOLIDAY	30		27	4th SAT HOLIDAY		
SUN			29		26	THIRD INTERNAL ASSESSMENT 8th Semester	31	GANESHA FESTIVAL	28			
MON			30		27				29			
TUE			31	**Industrial Visit** for 4th Semester	28				30			
WED					29	8TH SEMESTER **"Project Exhibition"**			31			ATTESTED COPY
THU					30	Last Working day of 8th semester						PRINCIPAL CITY ENGINEERING COLLEGE Kamakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

ACADEMIC YEAR : 2021-2022 (Even)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE PREFERNCE

Name of the Faculty: Vinod Kumar .S

Designation: A.P

Year / Semester:

Sl.No	Course Code and Name	Year/Semester
1	18CSL86 - Big Data Analytics	4th / 8th
2	18CS42 - Design & Analysis of Algorithm	2nd / 4th
3	18CSMP68 - Mobile Application Development	3rd / 6th

S. Vinod

Signature of faculty

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

ACADEMIC YEAR : 2021-22(Even)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

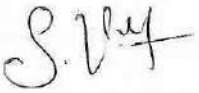
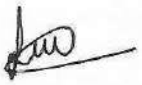
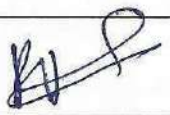
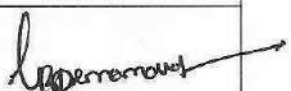
COURSE ALLOCATION

Sl.No	Name of the Faculty	Course Code and Name	Year/ Semester	Signature
1	Dr. Nanda Kumar A N	18CS81-Internet of Things 18CSI85-Internship	4th/8th	
2	Dr. Sowmya Naik P. T.	17CS832-User Interface Design	4th/8th	
3	Dr. Y S Kumarswamy	18ME651- Non Conventional Energy	3rd /6th	
4	Dr.Venkataramana K	18CS822-Storage Area Network	4th/8th	
5	Dr.K G S Venkatesan	18CS81-Internet of Things	4th/8th	
6	Dr. Jagannath	18CS45-Object Oriented Programming	2nd /4th	
7	Dr. N Rajashekar Reddy	18CS822-Storage Area Network	4th/8th	
8	Dr. Vinay Babu	18CS46- Data Communication	2nd /4th	
9	Dr.Sairabanu	18CSS84-Project Phase I	4th/8th	
10	Mrs Ambika P R	18CS43-Microcontroller and Embedded system 18CSL48- MC&ES Lab	2nd /4th	
11	Mr.Vivekavardhana Reddy B.	18CSL67-Data Mining and Data Warehousing	3rd /6th	

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

12	Mr. G. A. Girish	18CS61-System software and compilers 18CSL66-SS Lab	3rd /6th	
13	Mr. Surendranath Gowda D C	17CS81- Internet of Things	4th/8th	
14	Mr. Vinod Kumar S.	18CSL66-SS Lab 18CSS84-Project Phase I 17CS82-Big Data Analytics	3rd /6th 4th/8th	
15	Mrs. Laxmi M. C.	18CS43-Operating Systems 18CSL48-MC&ES Lab	2nd /4th	
16	Mrs. Archana Bhat	18CS43-Microcontroller and Embedded system 18CSL48- MC&ES Lab	2nd /4th	
17	Mr. B. Ramesh	18CSL67-CGLab	3rd /6th	
18	Ms. Deepika R	18CS42-Design and Analysis of Algorithm	2nd /4th	
19	Mrs. Punitha P.	18CS61-System software and compilers	3rd /6th	
20	Mr.GangappaDemannavar	18CSL48-DAA Lab	2nd /4th	
21	Mr. Doreswamy G S	18CSL48-DAA Lab	2nd /4th	
22	Mrs. Tejaswini B N	18CS43-Operating Systems 18CSMP68- Mobile Application Development	2nd /4th 3rd /6th	
23	Mrs. Nandini S B	18CS62- Computer Graphics and Visualization	3rd /6th	

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

ACADEMIC YEAR : 2021-2022 (Even)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE PREFERNCE

Name of the Faculty: Tejaswini B N

Designation: A.P

Year / Semester:

Sl.No	Course Code and Name	Year/Semester
1	18CS43 - Operating Systems	3rd/4th
2	18CSMP-68 - Mobile Application Development	3rd/4th
3	18CS61 - System software & Compilers	3rd/6th

Signature of faculty

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

		18CSL67-CGLab		
24	Mrs. Sangeetha Rao S	18CS63-Web Technology and its Applications 18CSL66-SS Lab	3rd /6th	
25	Mrs. Jamuna	18CSL48-DAA Lab	2nd /4th	
26	Mr. Channabasappa	18CSMP68- Mobile Application Development	3rd /6th	
27	Mr. Rakesh M	18CSL48-DAA Lab 18CS42-Design and Analysis of Algorithm	2nd /4th	
28	Mrs. Swethashree R N	18CSL67-CGLab	3rd /6th	
29	Mrs. Salika Fathima	18CSMP68- Mobile Application Development	3rd /6th	
30	Mrs. Shruthi Vijay	18CS63-Web Technologies and Applications	3rd /6th	
31	Mrs. Vinutha H M	18CS62- Computer Graphics and Visualization 18CSMP68- Mobile Application Development	3rd /6th	

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

Department Of CSE

APRIL 2022

Time Table for IV Sem A Section

Room: C-201

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	OS	DC	Short Break	MES	OOC	Lunch Break	LAB A1-DAA/ A2 -MES		
TUE	M4	MES		DAA	DC		MES – T	DAA – T	
WED	MES	M4		OOC	DAA		LAB A1 -MES / A2-DAA		
THU	M4-T	OOC		DAA	OS				
FRI	DC	OS		M4-T	DAA - T				
SAT	CPH	OS		DC					

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18MAT41	Complex Analysis, Probability and Statistical Methods	Maths	Mrs. Vanitha
2	18CS42	Design and Analysis of Algorithms	DAA	Mrs. Deepika R
3	18CS43	Operating Systems	OS	Mrs. Tejaswini B N
4	18CS44	Microcontroller and Embedded Systems	MES	Mrs. Ambika P R
5	18CS45	Object Oriented Concepts	OOC	Dr. Jagannath
6	18CS46	Data Communication	DC	Mr. Nandish A C
7	18CSL47	Design and Analysis of Algorithms Laboratory	DAA Lab	Mr. Rakesh / Mr. Gangappa/ Mr. Doreswamy
8	18CSL48	Microcontroller and Embedded Systems Laboratory	MES Lab	Mrs. Ambika P R/ Mrs. Archana Bhat/ Mrs. Laxmi
9	18CPH49	Constitution of India, Professional Ethics and Human Rights	CPH	Dr. Rajashekar

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PRINCIPAL

CITY ENGINEERING COLLEGE

Department Of CSE

APRIL 2022

Time Table for IV Sem B Section

Room: C-202

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	MES	OOC	Short Break	M4	DAA	Lunch Break			
TUE	DC	OS		M4	OOC		LAB B1-DAA / B2-MES		
WED	DAA	DC		M4	OS		DAA – T	MES -T	
THU	DAA	MES		M4	OOC		LAB B2- DAA/ B1 -MES		
FRI	OS	MES		DC	DAA - T				
SAT	MES – T	OS		CPH					

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18MAT41	Complex Analysis, Probability and Statistical Methods	Maths	Mrs. Gayathri
2	18CS42	Design and Analysis of Algorithms	DAA	Mrs. Rakesh
3	18CS43	Operating Systems	OS	Mrs. Laxmi M C
4	18CS44	Microcontroller and Embedded Systems	MES	Mrs. Archana Bhat
5	18CS45	Object Oriented Concepts	OOC	Dr. Jagannath
6	18CS46	Data Communication	DC	Mr. Nandish A C
7	18CSL47	Design and Analysis of Algorithms Laboratory	DAA Lab	Mr. Rakesh / Mr. Gangappa/ Mr. Doreswamy
8	18CSL48	Microcontroller and Embedded Systems Laboratory	MES Lab	Mrs. Ambika P R/ Mrs. Archana Bhat/ Mrs. Laxmi
9	18CPH49	Constitution of India, Professional Ethics and Human Rights	CPH	Dr. Rajashekar

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PRINCIPAL

CITY ENGINEERING COLLEGE

Department Of CSE

APRIL 2022

Time Table for VI Sem A Section

Room: C-203

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	SSC	CG	Short Break	NCE	DM	Lunch Break	LAB A1- MAD/ A2 -SS/ A3 -CG		
TUE	WEB	NCE		CG	DM		MAD – T	MAD - T	
WED	NCE	SSC		DM	WEB		LAB A1- SS/ A2- CG/ A3- MAD		
THU	CG	LAB		A1-CG/ A2-MAD/ A3-SS			SSC – T	WEB – T	CG - T
FRI	WEB	CG – T		SSC	WEB – T		SSC- T	SS LAB -T	
SAT									

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18CS61	System Software and Compilers	SSC	Mr. Girish G A
2	18CS62	Computer Graphics and Visualization	CG	Mrs. Nandini S B
3	18CS63	Web Technologies and its Applications	WEB	Mrs. Sangeetha Rao
4	18CS641	Data Mining and Data warehousing	DM	Dr. S Vagdevi
5	18ME651	Non Conventional Energy	NCE	Dr. Y S Kumaraswamy
6	18CSL66	System Software Laboratory	SS Lab	Mr. Girish G A/ Mr. Vinod/ Mrs. Sangeetha Rao
7	18CSL67	Computer Graphics Lab with Mini Project	CG Lab	Mrs. Nandini S B/ Mr. Ramesh/ Mrs. Swethashree
8	18CSMP68	Mobile Application Development	MAD Lab	Ms. Vinutha H M/ Mrs. Tejaswini B N/ Mr. Channabasappa

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PRINCIPAL

CITY ENGINEERING COLLEGE

Department Of CSE

APRIL 2022

Time Table for VI Sem B Section

Room: C-204

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	NCE	WEB	Short Break	DM	SSC	Lunch Break	CG – T	SSC – T	SS - T
TUE	CG	SSC		DM	NCE		A1 – MAD/ A2 -SS/ A3 - CG		
WED	WEB	CG		NCE	DM		MAD – T	MAD - T	
THU	SSC	WEB		CG	WEB -T		A1 – CG/ A2 – MAD/ A3-SS		
FRI	WEB – T	LAB		A1 – SS / A2 - CG/ A3 - MAD			SS – T	CG - T	
SAT									

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18CS61	System Software and Compilers	SSC	Mrs. Punitha P
2	18CS62	Computer Graphics and Visualization	CG	Mrs. Vinutha H M
3	18CS63	Web Technologies and its Applications	WEB	Mrs. Shruthi Vijay
4	18CS641	Data Mining and Data warehousing	DM	Dr. S Vagdevi
5	18ME651	Non Conventional Energy	NCE	Dr. Y S Kumaraswamy
6	18CSL66	System Software Laboratory	SS Lab	Mr. Girish G A/ Mr. Vinod/ Mrs. Sangeetha Rao
7	18CSL67	Computer Graphics Lab with Mini Project	CG Lab	Mrs. Nandini S B/ Mr. Ramesh/ Mrs. Swethashree
8	18CSMP68	Mobile Application Development	MAD Lab	Ms. Vinutha H M/ Mrs. Tejaswini B N/ Mr. Channabasappa

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PRINCIPAL

CITY ENGINEERING COLLEGE

Department Of CSE

APRIL 2022

Time Table for VIII Sem B Section (17 Scheme) **Room: C-302**

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	BDA	IOT	Short Break	UID	Seminar	Lunch Break	Seminar		
TUE	IOT	BDA		UID	Project Work		Project Work		
WED	BDA	IOT		UID	Project Work		Project Work/ Seminar/ Internship		
THU	Project Work/ Seminar/ Internship			Project Work/ Seminar/ Internship			Project Work/ Seminar/ Internship		
FRI	Project Work/ Seminar/ Internship			Project Work/ Seminar/ Internship			Project Work/ Seminar/ Internship		
SAT									

Sl . No	Course Code	Course Name	Course	Faculty Name
1	17CS81	Internet of Things and Applications	IOT	Mr. Surendranatha Gowda
2	17CS82	Big Data Analytics	BDA	Mr. Vinodh Kumar S
3	17CS832	User Interface Design	UID	Dr. Sowmya Naik P T
4	17CS84	Internship/ Professional Practice	INT	Mr. Nandish A C/ Mr. Vinodh Kumar
5	17CSP85	Project Work Phase – II	PW	Mr. Nandish A C/ Mr. Vinodh Kumar
6	17CSS86	Seminar		Dr. Nandakumar A N

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PRINCIPAL

CITY ENGINEERING COLLEGE

Department Of CSE

APRIL 2022

Time Table for VIII Sem A Section

Room: C-303

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	IOT	SAN	Short Break	IOT	Project Work	Lunch Break	Project Work		
TUE	SAN	IOT		SAN	Seminar		Technical Seminar		
WED	Project Work/ Seminar/ Internship			Project Work/ Seminar/ Internship			Project Work/ Seminar/ Internship		
THU	Project Work/ Seminar/ Internship			Project Work/ Seminar/ Internship			Project Work/ Seminar/ Internship		
FRI	Project Work/ Seminar/ Internship			Project Work/ Seminar/ Internship			Project Work/ Seminar/ Internship		
SAT									

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18CS81	Internet of Things and Applications	IOT	Dr. Nandakumar A N
2	18CS822	Storage Area Network	SAN	Dr. N Rajasekhar Reddy
4	18CSP83	Project Work Phase – II	PW	Mr. Nandish A C/ Mr. Vinodh Kumar
5	18CSS84	Technical Seminar		Mr. Nandish A C/ Mr. Vinodh Kumar
6	18CSI85	Internship	INT	Dr. Nandakumar A N

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PRINCIPAL

CITY ENGINEERING COLLEGE

Department Of CSE

APRIL 2022

Time Table for VIII Sem B Section

Room: C-304

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	SAN	IOT	Short Break	SAN	Seminar	Lunch Break	Technical Seminar		
TUE	IOT	SAN		IOT	Project Work		Project Work		
WED	Project Work/ Seminar/ Internship			Project Work/ Seminar/ Internship			Project Work/ Seminar/ Internship		
THU	Project Work/ Seminar/ Internship			Project Work/ Seminar/ Internship			Project Work/ Seminar/ Internship		
FRI	Project Work/ Seminar/ Internship			Project Work/ Seminar/ Internship			Project Work/ Seminar/ Internship		
SAT									

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18CS81	Internet of Things and Applications	IOT	Dr. Nandakumar A N
2	18CS822	Storage Area Network	SAN	Dr. N Rajasekhar Reddy
4	18CSP83	Project Work Phase – II	PW	Mr. Nandish A C/ Mr. Vinodh Kumar
5	18CSS84	Technical Seminar		Mr. Nandish A C/ Mr. Vinodh Kumar
6	18CSI85	Internship	INT	Dr. Nandakumar A N

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PRINCIPAL

CITY ENGINEERING COLLEGE

Department Of CSE

April 2022

Faculty Name: Dr. S Vagdevi **Sem: VI- A, B** **Subject: Data Mining & Data warehousing**

DAY	9:00 – 10:00	10:00 – 11:00		11:15 - 12:15	12:15 – 1:15		2:00 – 3:00 PM	3:00 – 4:00	4:00 – 5:00
MON			Short Break	B	A	Lunch Break			
TUE				B	A				
WED				A	B				
THU									
FRI									
SAT									

HOD

Principal

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Scheme of Teaching and Examination 2018 – 19
Choice Based Credit System (CBCS) AND Outcome Based Education (OBE)
(Effective from the academic year 2018 – 19)

VI SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P					
1	PCC	18CS61	System Software and Compilers	CS / IS	3	2	--	03	40	60	100	4
2	PCC	18CS62	Computer Graphics and Visualization	CS / IS	3	2	--	03	40	60	100	4
3	PCC	18CS63	Web Technology and its applications	CS / IS	3	2	--	03	40	60	100	4
4	PEC	18CS64X	Professional Elective -1	CS / IS	3	--	--	03	40	60	100	3
5	OEC	18CS65X	Open Elective –A	CS / IS	3	--	--	03	40	60	100	3
6	PCC	18CSL66	System Software Laboratory	CS / IS	--	2	2	03	40	60	100	2
7	PCC	18CSL67	Computer Graphics Laboratory with mini project	CS / IS	--	2	2	03	40	60	100	2
8	MP	18CSMP68	Mobile Application Development	CS / IS	--	--	2	03	40	60	100	2
9	INT	--	Internship	(To be carried out during the intervening vacations of VI and VII semesters)				--	--	--	--	--
				TOTAL	15	10	06	24	320	480	800	24

Note: PCC: Professional core, PEC: Professional Elective, OE: Open Elective, MP: Mini-project, INT: Internship.

Professional Elective -1

Course code under18XX64X	Course Title
18CS641	Data Mining and Data Warehousing
18CS642	Object Oriented Modelling and Design
18CS643	Cloud Computing and its Applications
18CS644	Advanced JAVA and J2EE
18CS645	System Modelling and Simulation

Open Elective –A (Not for CSE / ISE Programs)

18CS651	Mobile Application Development
18CS652	Introduction to Data Structures and Algorithms
18CS653	Programming in JAVA
18CS654	Introduction to Operating System

Students can select any one of the open electives offered by any Department (Please refer to the list of open electives under 18CS65X)
Selection of an open elective is not allowed provided,

- The candidate has studied the same course during the previous semesters of the programme.
- The syllabus content of open elective is similar to that of Departmental core courses or professional electives.
- A similar course, under any category, is prescribed in the higher semesters of the programme.

Registration to electives shall be documented under the guidance of Programme Coordinator/ Adviser/Mentor.

Mini-project work: Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary Mini project can be assigned to an individual student or to a group having not more than 4 students.

CIE procedure for Mini-project:

(i) Single discipline: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide. The CIE marks awarded for the Mini-project work, shall be based on the evaluation of project report, project presentation skill and question and answer session in the ratio 50:25:25.The marks awarded for the project report shall be the same for all the batch mates.

(ii) Interdisciplinary: Continuous Internal Evaluation shall be group wise at the college level with the participation of all the guides of the college. The CIE marks awarded for the Mini-project, shall be based on the evaluation of project report, project presentation skill and question and answer session in the ratio 50:25:25 The marks awarded for the project report shall be the same for all the batch mates.

SEE for Mini-project:

(i) Single discipline: Contribution to the Mini-project and the performance of each group member shall be assessed individually in the semester end examination (SEE) conducted at the department.

(ii) Interdisciplinary: Contribution to the Mini-project and the performance of each group member shall be assessed individually in semester end examination (SEE) conducted separately at the departments to which the student/s belongs to.

Internship: All the students admitted to III year of BE/B.Tech shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A University examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not takeup/complete the internship shall be declared fail and shall have to complete during subsequent University examination after satisfying the internship requirements.

AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.

DATA MINING AND DATA WAREHOUSING (Effective from the academic year 2018 -2019) SEMESTER – VI			
Course Code	**18CS641**	**CIE Marks**	40
Number of Contact Hours/Week	3:0:0	**SEE Marks**	60
Total Number of Contact Hours	40	**Exam Hours**	03
CREDITS –3			

Course Learning Objectives: This course (18CS641) will enable students to:

- Define multi-dimensional data models.
- Explain rules related to association, classification and clustering analysis.
- Compare and contrast between different classification and clustering algorithms

Module 1	**Contact Hours**
Data Warehousing & modeling: Basic Concepts: Data Warehousing: A multitier Architecture, Data warehouse models: Enterprise warehouse, Data mart and virtual warehouse, Extraction, Transformation and loading, Data Cube: A multidimensional data model, Stars, Snowflakes and Fact constellations: Schemas for multidimensional Data models, Dimensions: The role of concept Hierarchies, Measures: Their Categorization and computation, Typical OLAP Operations **Textbook 2: Ch.4.1,4.2** **RBT: L1, L2, L3**	08
Module 2	
Data warehouse implementation& Data mining: Efficient Data Cube computation: An overview, Indexing OLAP Data: Bitmap index and join index, Efficient processing of OLAP Queries, OLAP server Architecture ROLAP versus MOLAP Versus HOLAP. : Introduction: What is data mining, Challenges, Data Mining Tasks, Data: Types of Data, Data Quality, Data Preprocessing, Measures of Similarity and Dissimilarity. **Textbook 2: Ch.4.4** **Textbook 1: Ch.1.1,1.2,1.4, 2.1 to 2.4** **RBT: L1, L2, L3**	08
Module 3	
Association Analysis: Association Analysis: Problem Definition, Frequent Item set Generation, Rule generation. Alternative Methods for Generating Frequent Item sets, FP-Growth Algorithm, Evaluation of Association Patterns. **Textbook 1: Ch 6.1 to 6.7 (Excluding 6.4)** **RBT: L1, L2, L3**	08
Module 4	
Classification: Decision Trees Induction, Method for Comparing Classifiers, Rule Based Classifiers, Nearest Neighbor Classifiers, Bayesian Classifiers. **Textbook 1: Ch 4.3,4.6,5.1,5.2,5.3** **RBT: L1, L2, L3**	08
Module 5	
Clustering Analysis: Overview, K-Means, Agglomerative Hierarchical Clustering, DBSCAN, Cluster Evaluation, Density-Based Clustering, Graph-Based Clustering, Scalable Clustering Algorithms. **Textbook 1: Ch 8.1 to 8.5, 9.3 to 9.5** **RBT: L1, L2, L3**	08

Course Outcomes: The student will be able to :

- Identify data mining problems and implement the data warehouse
- Write association rules for a given data pattern.
- Choose between classification and clustering solution.

Question Paper Pattern:

- The question paper will have ten questions.
- Each full Question consisting of 20 marks
- There will be 2 full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub questions covering all the topics under a module.
- The students will have to answer 5 full questions, selecting one full question from each module.

Textbooks:

1. Pang-Ning Tan, Michael Steinbach, Vipin Kumar: Introduction to Data Mining, Pearson, First impression,2014.
2. Jiawei Han, Micheline Kamber, Jian Pei: Data Mining -Concepts and Techniques, 3rd Edition, Morgan Kaufmann Publisher, 2012.

Reference Books:

1. Sam Anahory, Dennis Murray: Data Warehousing in the Real World, Pearson,Tenth Impression,2012.
2. Michael.J.Berry,Gordon.S.Linoff: Mastering Data Mining , Wiley Edition, second edtion,2012.

CITY
ENGINEERING COLLEGE

Kanakapura Road, near METRO Station, Doddakallasandra, Bikasipura,
Bengaluru, 560062

Lesson Plan

Department: Computer Science & Engineering		Academic Semester: Even 2022-22	
Semester: 6	Section: - A & B	Course Code: 18CS641	Contact Hrs /week: 3
Course name: Data Mining & Data Warehousing			No. of Credits
Teacher's name: Dr. S VAGDEVI		Designation: Prof. & Head, AI & ML	
CIE: 40		SEE : 60	Exam Hours: 03

Prerequisites if any:			
Course code	Course Name	Description	Semester
18CS54	DBMS	Prerequisite topics include database, Description of metadata, Schema diagrams	V

Content delivery methods:	a. **Chalk and Talk method of classes** b. **ICT enables classes : Videos & PPT** c. **Learner Centric approaches:** **Google Quiz** **Case studies** **Hands On using Phython and WEKA tool** **Flip mode of teaching**

Course Syllabus (as prescribed by VTU)

Module No	Module Contents	Hours	COs
1	**Data Warehousing& modelling:** Basic Concepts: Data Warehousing: A multitier Architecture, Data warehouse models: Enterprise warehouse, Data mart and virtual warehouse, Extraction, Transformation and loading, Data Cube: A multidimensional data model, Stars, Snowflakes and Fact constellations: Schemas for multidimensional Data models, Dimensions: The role of concept Hierarchies, Measures: Their Categorization and computation, Typical OLAP Operations.	10	CO1

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

2	**Data warehouse implementation & Data mining:** Efficient Data Cube computation: An overview, Indexing OLAP Data: Bitmap index and join index, Efficient processing of OLAP Queries, OLAP server Architecture ROLAP versus MOLAP Versus HOLAP.: Introduction: What is data mining, Challenges, Data Mining Tasks, Data: Types of Data, Data Quality, Data Pre-processing, Measures of Similarity and Dissimilarity,	10	CO2
3	**Association Analysis:** Association Analysis: Problem Definition, Frequent Item set Generation, Rule generation. Alternative Methods for Generating Frequent Item sets, FP-Growth Algorithm, Evaluation of Association Patterns	10	CO3
4	**Classification:** Decision Trees Induction, Method for Comparing Classifiers, Rule Based Classifiers, Nearest Neighbor Classifiers, Bayesian Classifiers.	10	CO4
5	**Clustering Analysis:** Overview, K-Means, Agglomerative Hierarchical Clustering, DBSCAN, Cluster Evaluation, Density-Based Clustering, Graph-Based Clustering, Scalable Clustering Algorithms.	10	CO5

COURSE OUTCOMES: At the end of the Course, the students will be able to:

CO1	Explore various warehousing architectures & data models
CO2	Understand measures for similarities and dissimilarities in data mining
CO3	Apply association rules for generating data pattern
CO4	Apply different classifiers to solve a data analysis problems
CO5	Apply clustering algorithms for solving data mining problems

Mapping of COs v/s POs:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	--	--	--	--	--	--	--	--	--	--
CO2	3	3	--	--	--	--	--	--	--	--	--	--
CO3	3	3	--	--	--	--	--	--	--	--	--	--
CO4	3	3	--	--	--	--	--	--	--	--	--	--
CO5	3	3	--	--	--	--	--	--	--	--	--	--

Correlation levels: 1-Slight (Low), 2-Moderate (Medium), 3-Substantial (High)

Gap(s) in the syllabus, if any	**1) Hands on not addressed in syllabus** **2) Data mining tools not addressed**

Topics to be covered beyond syllabus	Hands on and WEKA tool will be used for the assignments

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

LESSON PLAN

Lecture #	Module #	Topics	RBT Levels	Course Outcome Mapping	Planned Date	Remarks
1	1	**Data Warehousing& modelling:** Basic Concepts: Data Warehousing: A multitier Architecture, Data warehouse models: Enterprise warehouse,	L2	CO1	4th to 6th April 2022	
2		Data mart and virtual warehouse, Extraction, Transformation and loading,			11th to 13th April 2022	
3		Data Cube: A multidimensional data model,			18th to 20th April 2022	
4		Stars, Snowflakes and Fact constellations:			25/4/2022	
5		Schemas for multidimensional Data models,			26/4/2022	
6		Dimensions: The role of concept Hierarchies, Measures:			27/4/2022	
7		Their Categorization and computation,			27/4/2022	
8		Typical OLAP Operations.			2/5/2022	
9		Activity on Analysing Schema for different Data Warehouses			2/5/2022	
10	2	**Data warehouse implementation & Data mining:** Efficient Data Cube computation: An overview	L2	CO2	9/5/2022	

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

11		Indexing OLAP Data: Bitmap index and join index,			9/5/2022	
12		Efficient processing of OLAP Queries, OLAP server Architecture			10/5/2022	
13		ROLAP versus MOLAP versus HOLAP.			10/5/2022	
14		Introduction: What is data mining, Challenges, Data Mining Tasks,			11/5/2022	
15		Data: Types of Data, Data Quality, Data Pre-processing,			23/5/2022	
16		Measures of Similarity and Dissimilarity	L2	CO2	24/5/2022	
17		Measures of Similarity and Dissimilarity			25/5/2022	
18		Problems on Similarity and Dissimilarity measures			25/5/2022	
19	3	**Association Analysis:** Association Analysis:			30/5/2022	
20		Problem Definition,			30/5/2022	
21		Frequent Item set Generation,			30/5/2022	
22		Rule generation.	L3	CO3	31/5/2022	
23		Alternative Methods for Generating			31/5/2022	
24		Frequent Item sets,			31/5/2022	
25		FP-Growth Algorithm,			1/6/2022	
26		Evaluation of Association Patterns			1/6/2022	

27		Additional Problems- Flip teaching , Quiz			1/6/2022	
28	5	**Clustering Analysis:** Overview, Algorithms.	L3	CO5	13/6/2022	
29		K-Means,			13/6/2022	
30		Agglomerative Hierarchical Clustering,			14/6/2022	
31		DBSCAN, Cluster Evaluation,			15/6/2022	
32		Density-Based Clustering			20/6/2022	
33		Graph-Based Clustering,			20/6/2022	
34		Scalable Clustering			21/6/2022	
35		Problems on Clustering , Quiz,			22/6/2022	
36		Quiz, Crossword puzzle			22/6/2022	
37	4	**Classification:** Decision Trees Induction,	L3	CO4	27/6/2022	
38		Decision Trees Induction			27/6/2022	
39		Method for Comparing Classifiers,			28/6/2022	
40		Method for Comparing Classifiers,			29/6/2022	
41		Rule Based Classifiers,			29/6/2022	
42		Rule Based Classifiers,			29/6/2022	
43		Nearest Neighbor Classifiers,			30/6/2022	
44		Bayesian Classifiers			30/6/2022	
45		Solving problems on Classifications and Revision			4/7/2022	

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

46		More Problem solving on Decision trees and classifications	L3	CO4	4/7/2022	
47	3,4,5	Discussion on Previous year QP, Inputs for Final Exam	L3	CO 3,4,5	4/7/2022	
48	3,4,5	Discussion on Previous year QP, Inputs for Final Exam	L3	CO3,4,5	5/7/2022	
49	4,5	Discussion on Previous year QP, Inputs for Final Exam	L3	CO3,4,5	5/7/2022	
50	All	Discussion on Previous year QP, Inputs for Final Exam	L2	CO1,2,3,4, 5	5/7/2022	

Text books: (As per VTU syllabus):

1.Pang-Ning Tan, Michael Steinbach, Vipin Kumar: Introduction to Data Mining, Pearson, First impression,2014.

2.Jiawei Han, Micheline Kamber, Jian Pei: Data Mining-Concepts and Techniques, 3rd Edition, Morgan Kaufmann Publisher, 2012.

References: (As per VTU syllabus)

1.Sam Anahory, Dennis Murray: Data Warehousing in the Real World, Pearson,Tenth Impression,2012.

2.Michael.J.Berry,Gordon.S.Linoff: Mastering Data Mining , Wiley Edition, second edtion,2012.

Teachers' sign

HOD's sign

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

Department of CSE

VI SEM A AY 2021-2022 EVEN SEMESTER

SL. NO	USN	NAME OF THE STUDENT	
1	1CE19CS001	AAKASH T E	
2	1CE19CS002	ACHYUTH MAHESH HEGDE	
3	1CE19CS003	AFRID PASHA H P	
4	1CE19CS004	AISHWARYA B M	
5	1CE19CS005	AISHWARYA C	
6	1CE19CS007	AMITH SINGH M	
7	1CE19CS008	ANANYA BHOMBORE	
8	1CE19CS009	APOORVA R SHET	
9	1CE19CS010	ARSHAD ULLA Z	
10	1CE19CS012	ASHWINI B	A1
11	1CE19CS013	B M PUNEETH	
12	1CE19CS014	BHANU PRAKASH R	
13	1CE19CS015	BHAVANA S	
14	1CE19CS016	BHOLAY NATH SINGH	
15	1CE19CS017	BINDHUSHREE G	
16	1CE19CS018	CHANDAN KUMAR C	
17	1CE19CS019	CHANDANA D Y	
18	1CE19CS020	CHANDINI R P	
19	1CE19CS021	CHARANSIMHA D	
20	1CE19CS022	CHETAN S	
21	1CE19CS023	CHETHAN R	
22	1CE19CS024	CHETHANRAJ H	
23	1CE19CS025	CHIRANJEEVI V	
24	1CE19CS026	DARSHAN K	
25	1CE19CS027	DEEPAK JADON	A2
26	1CE19CS028	DEEPTHY RASHMI R	
27	1CE19CS029	DHANUSH S	
28	1CE19CS030	DIVYA S A	
29	1CE19CS031	FOZAIL AHMED	

SL. NO	USN	NAME OF THE STUDENT	
30	1CE19CS032	GEETHANSH P	
31	1CE19CS033	HARISH BABU K P	
32	1CE19CS034	HARSHITH G R	
33	1CE19CS035	HEMANTH V	
34	1CE19CS037	IQRA FATHIMA	
35	1CE19CS038	JAANESHWAR DA	A2
36	1CE19CS039	JEEVAN M	
37	1CE19CS040	JYOTHI SHREE S R	
38	1CE19CS041	KAVANA B	
39	1CE19CS042	KEERTHI CHANDRA N L	
40	1CE19CS043	KEERTHI KUMARI	
41	1CE19CS044	KISHAN GOWDA	
42	1CE19CS045	KRITHIKA N KOUSHIK	
43	1CE19CS046	KRUTTIKA KIRANKUMAR BHOMKAR	
44	1CE19CS047	MANASA R	
45	1CE19CS048	MANOHAR M	
46	1CE19CS049	MANOJ M K	
47	1CE19CS050	MANOJ R	
48	1CE19CS051	MARIA MONICA P	A3
49	1CE19CS052	MOHAMMED UZAIR BAIG	
50	1CE19CS056	MRUDULA S PRASAD	
51	1CE19CS058	NISHANTH NAYAKA N R	
52	1CE19CS059	NITHIN RAJ GOWDA	
53	1CE19CS076	SAIMA SHEIK	
54	1CE19CS081	SHANKARLINGA M MATTIMANI	
55	1CE19CS085	SPOORTHI H M	
56	1CE19CS092	SYED MUTAIB ULLA	
57	1CE19CS103	X SEMANTHA MERCY	

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

Department of CSE

VI SEM B AY 2021-2022 EVEN SEMESTER

SL. NO	USN	NAME OF THE STUDENT	
1	1CE19CS006	AMIR REHAN	
	1CE19CS011	ARTEE KUMARI R	
2	1CE19CS053	MOHAMMED SAMEER	
3	1CE19CS054	MONIKA J	
4	1CE19CS055	MRITUNJAY MISHRA	
5	1CE19CS057	MULGE RAHUL KUMAR	
6	1CE19CS060	POOJA SURESH	
7	1CE19CS061	POOJASHREE K	
8	1CE19CS062	PRABHANJAN V KOLAR	
9	1CE19CS063	PRASHANTH K	B1
10	1CE19CS066	R FAZEELA FATHIMA	
11	1CE19CS067	RAHUL K R	
12	1CE19CS068	RAKSHANDA AIMAN GOLANDAZ	
13	1CE19CS069	RAKSHITHA C R	
14	1CE19CS070	RAKSHITHA G M	
15	1CE19CS071	RATNADEEP ANIL MORE	
16	1CE19CS072	ROHIT GEHLOT	
17	1CE19CS073	SACHIN H M	
18	1CE19CS074	SAGAR T R	
1	1CE19CS075	SAHANA GOPALKRISHNA HEBBAR	
20	1CE19CS077	SALFIYA MUSKAN	
21	1CE19CS078	SAMBANGI SAITEJA	
22	1CE19CS079	SANGEETHA M S	
23	1CE19CS080	SHALINI R	
24	1CE19CS082	SHARADHI SHETTY D	B2
25	1CE19CS083	SHIVAPRASAD M B	
26	1CE19CS084	SHIVARAJ HIREMATH	
27	1CE19CS086	SRISHTI SHARMA	
28	1CE19CS087	SRIVATSA S	
29	1CE19CS088	SRUSTI K G	

SL. NO	USN	NAME OF THE STUDENT	
30	1CE19CS089	SUMAN S	
31	1CE19CS090	SUMMAIYA TAJ A	
32	1CE19CS091	SUMUKH K	
33	1CE19CS094	TARUN G	
34	1CE19CS095	TAUQEER AHMED	B2
35	1CE19CS096	VEERESH BUDESHREDDY PATIL	
36	1CE19CS097	VEERKUMAR SOMANAGOWDABIRADARA	
37	1CE19CS098	VIDYA D	
38	1CE19CS099	VINITHA V	
39	1CE19CS100	VISHNU P	
40	1CE19CS101	VISHRUTHA V	
41	1CE19CS102	VIVEK B U	
42	1CE18CS007	ANISHA SAMPANNA	
43	1CE18CS032	KAVANASAGAR H	
44	1CE18CS038	LAKSHMI ESH D	
45	1CE18CS043	MEZY SANDRA DSOUZA	
46	1CE18CS051	NIRANJAN M	
47	1CE18CS063	RAHULKUMAR	B3
48	1CE18CS066	SAHANA R	
49	1CE18CS072	SHILPA N	
50	1CE18CS074	SHRAAVYA S	
51	1CE18CS076	SHREYS B S GOWDA	
52	1CE18CS077	SHREYAS V	
53	1CE18CS091	ULLAS M	
54	1CE18CS096	VARSHA H	
55	1CE20CS400	ARCHANA C	
56	1CE20CS401	PRADEEP K S	

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CBCS SCHEME

USN | | | | | | | | | | |

15CS651

Sixth Semester B.E. Degree Examination, June/July 2019
Data Mining and Data Warehousing

Time: 3 hrs. Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Describe a 3 – tier data warehousing architecture (06 Marks)

b. Compare OLTP and OLAP Systems (06 Marks)

c. What is a Data warehouse and what are its four key features? (04 Marks)

OR

2 a. Explain with suitable examples the various OLAP operations in a multidimensional data model. (07 Marks)

b. Explain the following terms with examples : i) Snowflake schema ii) Fact constellation schema iii) Star schema (09 Marks)

Module-2

3 a. Describe ROLAP, MOLAP, HOLAP (06 Marks)

b. What is Data Mining? With a neat diagram, explain the KDD process in data mining. (06 Marks)

c. For the following vectors X and Y, calculate the cosine similarity, where
X = (3, 2, 0, 5, 0, 0, 0, 2, 0, 0); Y = (1, 0, 0, 0, 0, 0, 0, 1, 0, 2) (04 Marks)

OR

4 a. Describe the various types of attributes and data sets (08 Marks)

b. Define Data preprocessing. Mention the steps involved in it. Explain any 2 steps in detail. (08 Marks)

Module-3

5 a. Briefly explain the Apriori Algorithm for frequent itemset generation. (05 Marks)

b. Explain the following terms with example
i) Rule generation ii) Computational complexity (06 Marks)

c. Generate frequent itemset for the given data with support = 50%. (05 Marks)

TID	100	200	300	400
Items	{1, 3, 4}	{2, 3, 5}	{1, 2, 3, 5}	{2, 5}

OR

6 a. Consider the following transaction data set
i) Construct an FP tree ii) Generate the list of frequent itemset (09 Marks)
Ordered by their corresponding suffixes

TID	1	2	3	4	5	6
Items	{a, b}	{b, c, d}	{a, c, d, e}	{a, d, e}	{a, b, c}	{a, b, c, d}

8	9	10
{a, b, c}	{a, b, d}	{b, c, e}

b. Briefly explain the candidate generation procedure using $F_{k-1} \times F_{k-1}$ Merging step. (07 Marks)

Module-4

7 a Explain how decision tree induction algorithm works. Give example (08 Marks)

b List and explain the different characteristics of decision tree induction (08 Marks)

OR

8 a Describe the nearest neighbour classification technique (09 Marks)

b Write a note on Bayesian classifier (07 Marks)

Module-5

9 a What is Cluster analysis? Describe the different types of clustering techniques with example (08 Marks)

b Explain the following terms

i) K – means clustering ii) Graph based clustering (08 Marks)

OR

10 a What are the basic approaches used for generating agglomerative hierarchical clustering? (08 Marks)

b Explain DBScan algorithm, with example. (08 Marks)

* * * * *

CBCS SCHEME

USN 15CS651

Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Data Mining and Data Warehousing

Time: 3 hrs. Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. What is Data warehouse? Explain three tier architecture of data warehouse (08 Marks)
b. Explain the schemas of multidimensional data models (08 Marks)

OR

2 a. What is Data cube measure? Explain the categorization of measures (08 Marks)
b. Explain data cube operations with examples (08 Marks)

Module-2

3 a. Explain data cube computation and curse of dimensionality (08 Marks)
b. Explain different methods of indexing OLAP data. (08 Marks)

OR

4 a. State and explain various data mining tasks. (08 Marks)
b. Define Similarity and dissimilarity between the objects. Find SMC and Jaccard's coefficient of two binary vectors.
X = (1, 0, 0, 0, 0, 0, 0, 0, 0, 0) Y = (0, 0, 0, 0, 0, 0, 1, 0, 0, 1). (08 Marks)

Module-3

5 a. What is Association Analysis? Explain Association rule , Support and Confidence (08 Marks)
b. State Apriori principle. Write apriori algorithm for frequent itemset (08 Marks)

OR

6 a. Construct an FP tree for the following dataset

TID	Items
1	{a, b}
2	{b, c, d}
3	{a, c, d, e}
4	{a, d, e}
5	{a, b, c}
6	{a, b, c, d}
7	{a}
8	{a, b, c}
9	{a, b, d}
10	{b, c, e}

(08 Marks)

b. Explain the strategies used in frequent itemset generation (08 Marks)

Module-4

7 a. Explain the general approach for solving classification problem (08 Marks)
b. Write the algorithm for decision tree induction (08 Marks)

OR

8 a. Explain the methods of comparing classifiers. (08 Marks)
b. Write the characteristics of nearest neighbor classifier (08 Marks)

Module-5

9 a. Explain the requirements of cluster analysis. (08 Marks)
b. State and explain K – means algorithm (08 Marks)

OR

10 a. Write DBSCAN clustering algorithm and estimate time and space complexity. (08 Marks)
b. State and explain the issues in cluster evaluation. (08 Marks)

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN | | | | | | | | | | |

10IS74

Seventh Semester B.E. Degree Examination, June/July 2015
Data Ware Housing and Data Mining

Time: 3 hrs. Max. Marks:100

Note: *Answer any FIVE full questions, selecting atleast TWO questions from each part.*

PART – A

1 a. Explain the characteristics of ODS. (06 Marks)
b. List the major steps involved in the ETL process. (06 Marks)
c. Based on oracle, what are difference between OLTP and data warehouse systems. (08 Marks)

2 a. Discuss the FASMI characteristics of OLAP. (05 Marks)
b. Explain Codd's OLAP rules. (10 Marks)
c. Describe the difference between ROLAP and MOLAP. (05 Marks)

3 a. What is data preprocessing? Explain various data preprocessing tasks. (14 Marks)
b. Explain the following :
i) Euclidean distance
ii) Simple matching coefficient
iii) Jaccard coefficient. (06 Marks)

4 a. Explain frequent itemset generation in the apriori algorithm. (10 Marks)
b. What is FP – Growth algorithm? In what way it is used to find frequency itemsets? (03 Marks)
c. Construct the FP tree for following data set. Show the trees separately after reading each transaction.

Tid	1	2	3	4	5
Items	{a, b}	{b, c, d}	{a, c, d, e}	{a, d, e}	{a, b, c}
Tid	6	7	8	9	10
Items	{a, b, c, d}	{a}	{a, b, c}	{a, b, d}	{b, c, e}

(07 Marks)

PART – B

5 a. What is classification? Explain the two classification models with example. (06 Marks)
b. Discuss the characteristics of decision tree induction algorithms. (10 Marks)
c. Explain sequential covering algorithm in rule –based classifier. (04 Marks)

6 a. List five criteria for evaluating classification methods. Discuss them briefly. (05 Marks)

b. What is predictive accuracy of classification methods? Explain different types of estimating the accuracy of a method. (07 Marks)

c. Consider the following training set for predicting the loan default problem :

Tid	Home owner	Marital status	Defaulted borrower	Annual income
1	Yes	Single	No	125 k
2	No	Married	No	100 k
3	No	Single	No	70 K
4	Yes	Married	No	120 k
5	No	Divorced	Yes	95 k
6	No	Married	No	60 k
7	Yes	Divorced	No	220 k
8	No	Single	Yes	85 k
9	No	Married	No	75 k
10	No	Single	Yes	90 k

Find the conditional independence for given training set using Bayes theorem for classification. (08 Marks)

7 a. List and explain the desired features of cluster analysis. (08 Marks)

b. Explain the K – means clustering algorithm with suitable examples. (12 Marks)

8 Write short notes on :

a. Web content mining

b. Unstructed text

c. Text clustering

d. Temporal data mining tasks. (20 Marks)

* * * * *

DMDW Question Bank -18CS641

Module 1:

1. What is data warehouse? Discuss key features
2. Differentiate between Operational Database Systems and Data Warehouses.
3. Differentiate between OLAP and OLTP
4. Why multidimensional views of data and data-cubes are used?
5. With a neat diagram, explain data-cube implementations.
6. Describe the Multitiered Architecture of data warehousing.
7. Explain the different data warehouse models with an example.
8. Explain the different OLAP operations in the multidimensional data model.
9. Explain the different indexing methods used in OLAP data.
10. Differentiate between ROLAP, MOLAP and HOLAP servers
11. State and explain the different data mining tasks.
12. What is a data cube measure. Explain how data cube measures are categorized.
13. Explain data cube operations with examples.
14. Explain the data cube computation and also the curse of dimensionality.
15. Explain the ETL process.
16. What is Metadata? Discuss different types of metadata used in Data Warehouse.
17. Write short notes on: i) ROLAP iii) Data cube ii) MOLAP
18. Explain the following operations of Datacube with suitable examples :
    (i) Roll-Up (ii) Drill Down

Module 2

1. What is data mining ? what are the applications of data mining.
2. Explain Knowledge data discovery KDD with a neat diagram. .
3. Discuss the challenges that motivate the development of Data Mining.
4. Explain the origin of data mining .
5. What is data mining? Explain various data mining task with examples.
6. What are data and data attributes ? Explain the types and properties of attributes. .
7. Differentiate between discrete and continuous attributes.
8. Distinguish between categorical and numerical attributes. .
9. Explain the types of data sets.
10. List and explain general characteristics of data sets.
11. What is data quality? What are the dimension that asses the data quality.
12. Describe any five datapreprocessing approaches. .
13. What is sampling? Explain simple random sampling v/s stratified sampling v/s progressive sampling.
14. Describe the various approaches for feature selection. .
15. What is curse of dimensionality? Explain .
16. What is similarity and dissimilarity? Explain similarity and dissimilarity measures between simpleattributes based on different types of attributes.
17. Discuss the measures of proximity between objects that involve multiple attribute.
18. Explain the cosine similarity for calculating the similarity of two documents with an example.
19. Consider the following vectors. Find a) Simple Matching Co-efficient b) Jaccard Co-efficient

    c) Hamming Distance .

    i)X: 0101010001 Y: 0100011000

    ii)X: 1000000000 Y: 0000001001
20. For the following vectors find: a) Cosine Similarity b) Correlation c) Jaccard Similarity

i)X: 0101 Y: 1010

ii)X: 110101 Y: 111001

21. For the following vectors find: a) Cosine Similarity b) Correlation

X: 3205000200

Y: 1000000102

22. Discuss whether or not each of the following activities is a data mining task.

(a) Dividing the customers of a company according to their gender.

(b) Dividing the customers of a company according to their profitability.

(c) Computing the total sales of a company.

(d) Sorting a student database based on student identification numbers.

(e) Predicting the outcomes of tossing a (fair) pair of dice.

(f) Predicting the future stock price of a company using historical records.

(g) Monitoring the heart rate of a patient for abnormalities.

(h) Monitoring seismic waves for earthquake activities.

(i) Extracting the frequencies of a sound wave

23. Classify the following attributes as binary, discrete, or continuous. Also classify them as qualitative(nominal or ordinal) or quantitative (interval or ratio). Some cases may have more

than one interpretation, so briefly indicate your reasoning if you think there may be some ambiguity.

Example: Age in years. Answer: Discrete, quantitative, ratio

(a) Time in terms of AM or PM.

(b) Brightness as measured by a light meter.

(c) Brightness as measured by people's judgments.

(d) Angles as measured in degrees between 0° and 360°.

(e) Bronze, Silver, and Gold medals as awarded at the Olympics.

(f) Height above sea level.

(g) Number of patients in a hospital.

(h) ISBN numbers for books. (Look up the format on the Web.)

(i) Ability to pass light in terms of the following values: opaque, translucent, transparent.

(j) Military rank.

(k) Distance from the center of campus.

MODULE 3:

1. What is association analysis? Define support and confidence with an example.

2. Develop the appriori algorithm for frequent itemset generation, with an example.

3. Explain the various measure of evaluating association patterns.

4. Explain in detail frequent itemset generation and rule generation with reference to appriorialong withan example.

5. Define following: a) Support b) Confidence.

6. Explain FP growth algorithm for discovering frequent item sets. What are its limitation.

7. Consider following transaction data set

TID	ITEM
1	{a, b}
2	{b, c, d}
3	{a, c, d, e}
4	{a, d, e}
5	{a, b, c}
6	{a, b, c, d}
7	{a}
8	{a, b, c}
9	{a, b, d}
10	{b, c, e}

Construct the FP tress by showing the tress separately after reading each transaction.

8. Illustrate the limitations of support confidence framework for evaluation of an association rule

9. Define cross support pattern. Suppose the support for milk is 70%, support for sugar is 10% and support for bread is 0.04%. given hc= 0.01. is the frequent item set {milk, sugar, bread} the cross- support pattern?

10. Which are the factors affecting the computational complexity of appriori algorithm?

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Explain them.

11. Define a frequent pattern tree. Discuss the method of computing a FP-Tree, with an algorithm.

12. Give an example to show that items in a strong association rule may actually be negatively corelated.

13. A database has five transactions. Let min-sup = 60% and min-conf = 80%

TID	ITEM
T1	{M. O. N. K. E. Y}
T2	{D. O. N. K. E. Y}
T3	{M. A. K. E}
T4	{M. U. C. K. Y}
T5	{C. O. O. K. I. E}

Find all frequent item sets using appriori and FP growth respectively.

14. Explain various alternative methods for generating frequent item sets.

15. A database has four transactions. Let min-sup = 40% and min-conf = 60%
Find all frequent item sets using appriori and FP growth algorithms. Compare the efficiency of twomeasuring process.

TID	DATE	ITEM
T1	01 01 10	{K. A. D. B}
T2	01 01 10	{D. A. C. E. B}
T3	01 15 10	{C. A. B. E}
T4	01 22 10	{B. A. D}

16. Explain various Candidate Generation and Pruning techniques.

17. Explain the various properties of objective measures.

18. Comprehend the Simpson's Paradox.

19. Illustrate the nature of Simpson's paradox for the following two-way contingency table

Buy HDTV	Buy Exercise machine		
	yes	no	
yes	99	81	180
no	54	66	120
	153	147	300

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

20. What is appriori algorithm? Give an example. A database has six transactions of purchase of booksfrom a book shop as given below

TID	ITEM
T1	{ANN. CC. JC. CG}
T2	{CC. D. CG}
T3	{ANN. D. CC. TC}
T4	{ANN. CC. D. CG}
T5	{ANN. CC. D. TC. CG}
T6	{C. D. TC}

Let X= {CC. TC} and Y= {ANN. TC. CC} find confidence and support of the association rule X→Y and inverse rule Y→X

20. Consider the following transaction data set:

TID	ITEM
T100	I_1. I_2. I_5
T200	I_2. I_4
T300	I_2. I_3
T400	I_1. I_2. I_4
T500	I_1. I_3
T600	I_2. I_3
T700	I_1. I_3
T800	I_1. I_2. I_3. I_5
T900	I_1. I_2. I_3

Construct FP Tree.Generate List of frequent item set ordered by their corresponding suffixes.

21. Consider following set of frequent 3 item sets

{1, 2, 3}	{1, 3, 5}
{1, 2, 4}	{2, 3, 4}
{1, 2, 5}	{2, 3, 5}
{1, 3, 4}	{3, 4, 5}

Assume that there are only 5 items in data set.

a) List all candidate 4 item sets obtained by a candidate generation procedure using Fk-1 X F1 merging strategy

b) List all candidate 4 item sets obtained by the candidate generation procedure in appriori,

22. Apply appriori algorithm for

TID	ITEM
101	Milk, Bread, Eggs
102	Milk, Juice
103	Juice, Butter
104	Milk, Bread, Eggs
105	Coffee, Eggs
106	Coffee
107	Coffee, Juice
108	Milk, Bread, Cookies, Eggs
109	Cookies, Butter
110	Milk, Bread

Item set = {Milk, Bread, Eggs, Cookies, Coffee, Butter, Juice}, use 0.2 for min-sup.

MODULE 4:

1. What is classification. Explain the general approach for solving a classification problem with an example.
2. How decision trees are used for classification. Explain decision tree induction algorithm for classification.
3. Write Hunts algorithm and illustrate it"s working.
4. Explain the Methods for Expressing Attribute Test Conditions.
5. Explain various measures for selecting the best split with an example.
6. Explain the importance of evaluation criterion for classification methods.
7. Explain the characteristics of decision tree Induction.
8. Explain Model Over fitting. What are the reasons for overfitting? How to address

overfitting problems

9. Explain how to estimate generalization errors.
10. List characteristics of decision tree induction.
11. Give the difference between rule-based ordering and class-based ordering scheme.
12. Explain rule-based classifier and its characteristics.
13. Explain the characteristics of rule based classifier
14. How to improve accuracy of classification. Explain
15. Explain k-nearest neighbor classification algorithm.
16. Explain any characteristics of the nearest neighbor classifier.
17. What is Baye"s theorem? Show how it is used for classification.
18. Explain with an example how naïve Baye „s algorithm used for classification.
19. Discuss the two common strategies for growing a classification rule.
20. Explain sequential covering algorithm for rule extraction.
21. Explain model building in Bayesian networks.

Module 5

1) Explain desired features of cluster analysis.
2) Explain how distance between a pair of points can be computed.
3) Write a short note on density-based methods.
4) Write and explain basic K-Means algorithm.
5) Explain DBSCAN clustering algorithm.
6) What are the limitations of K Means algorithm.
7) Explain cluster analysis methods briefly.
8) Explain agglomerative hierarchical clustering.
9) Explain bisecting K Means algorithm.
10) Distinguish between various types of clustering.
11) What are unsupervised, supervised and relative evaluation measures that are applied to judgevarious aspects of cluster validity.
12) Explain different types of defining proximity between clusters.
13) Differentiate between exclusive and overlapping clustering.

14) What are the various issues considered for cluster validation? Explain different evaluationmeasures used for cluster validity.

15) Explain unsupervised cluster evaluation using cohesion and separation.

16) Explain unsupervised cluster evaluation using proximity matrix.

17) List and explain classification-oriented measures of cluster validity.

18) Explain similarity – oriented measures of cluster validity.

19) Explain grid-based clustering algorithm.

20) Explain subspace clustering.

21) Write and explain CLIQUE algorithm.

22) Write and explain DENCLUE algorithm.

23) Explain different graph-based clustering

Vagdevi S

****

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

Kanakapura Road, near METRO Station, Doddakallasandra, Bikasipura,
Bengaluru, 560062

GOOGLE CLASSROOM RESOURCES

Subject Name: Data Mining and Ware housing

Subject Code: 18CS641

Google Classroom Code:

VI A Section - o25545y

https://classroom.google.com/c/NDg1ODE0OTI0NzA2?cjc=o25545y

VI B Section - uf6qibk

https://classroom.google.com/c/NDg1ODE5MTkwNTI3?cjc=uf6qibk

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE
Kanakapura Road, near METRO Station, Doddakallasandra
Bikasipura, Bengaluru, Karnataka 560062

Sl No	USN	Name of Student	Case Study
1	1CE19CS001	AAKASH T E	A data base is being constructed to keep track of the teams and games of a sports league, A team has a number of players, not all of whom participate in each game. It is desired to keep track of the players participating in each game for each team, the positions they played in that game and the result of the game a. Select a business process from the above requirements b. Draw the dimensional modeling for the same c. Create an event tracking fact table for the business process and explain the same d. If the business analyzer is interested only with one particular game E.g cricket , how do you enhance your DM. write the cuboid structure for the same
2	1CE19CS002	ACHYUTH MAHESH HEGDE	
3	1CE19CS003	AFRID PASHA H P	
4	1CE19CS004	AISHWARYA B M	
5	1CE19CS005	AISHWARYA C	Suppose that a data warehouse for Big University consists of the following four dimensions: student, course, semester, and instructor, and two measures count and avg_grade. When at the lowest conceptual level (e.g., for a given student, course, semester, and instructor combination), the avg_grade measure stores the actual course grade of the student. At higher conceptual levels, avg_grade stores the average grade for the given combination. (a) Draw a snowflake schema diagram for the data warehouse. (b) Starting with the base cuboid [student, course, semester, instructor], what specific OLAP operations (e.g., roll-up from semester to year) should one perform in order to list the average grade of CS courses for each Big University student. (c) If each dimension has five levels (including all), such as "student < major < status < university < all", how many cuboids will this cube contain (including the base and apex cuboids)?
6	1CE19CS007	AMITH SINGH M	
7	1CE19CS008	ANANYA BHOMBORE	
8	1CE19CS009	APOORVA R SHET	
9	1CE19CS010	ARSHAD ULLA Z	Suppose that a data warehouse for Textile Industry consists of the following four dimensions: Textile Product, color, size, and texture. (a) Draw a snowflake schema diagram for the data warehouse. (b) Starting with the base cuboid (c) If each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)?
10	1CE19CS012	ASHWINI B	
11	1CE19CS013	B M PUNEETH	
12	1CE19CS014	BHANU PRAKASH R	
13	1CE19CS015	BHAVANA S	A database is to be constructed to keep track of all the entities and measures of food industry a) Select the business process for assignment b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure
14	1CE19CS016	BHOLAY NATH SINGH	
15	1CE19CS017	BINDHUSHREE G	
16	1CE19CS018	CHANDAN KUMAR C	
17	1CE19CS019	CHANDANA D Y	A database is to be constructed to keep track of all the entities and measures of Film industry a) Select the business process for assignment b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure
18	1CE19CS020	CHANDINI R P	
19	1CE19CS021	CHARANSIMHA D	
20	1CE19CS022	CHETAN S	
21	1CE19CS023	CHETHAN R	A database is to be constructed to keep track of all the entities and measures of Employee Database a) Select the business process for assignment b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure
22	1CE19CS024	CHETHANRAJ H	
23	1CE19CS025	CHIRANJEEVI V	
24	1CE19CS026	DARSHAN K	
25	1CE19CS027	DEEPAK JADON	A database is to be constructed to keep track of all the entities and measures of Zoo database a) Select the business process for assignment b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure
26	1CE19CS028	DEEPTHY RASHMI R	
27	1CE19CS029	DHANUSH S	
28	1CE19CS030	DIVYA S A	

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Sl No	USN	Name of Student	Case Study
29	1CE19CS031	FOZAIL AHMED	A database is to be constructed to keep track of all the entities and measures of IT industry a) Select the business process for assignment b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure
30	1CE19CS032	GEETHANSH P	
31	1CE19CS033	HARISH BABU K P	
32	1CE19CS034	HARSHITH G R	
33	1CE19CS035	HEMANTH V	A database is to be constructed to keep track of all the entities and measures of Library Management System. a) Select the business process for assignment. b) Draw the dimensional modelling for the same considering all the three schemas. c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure
34	1CE19CS037	IQRA FATHIMA	
35	1CE19CS038	JAANESHWAR DA	
36	1CE19CS039	JEEVAN M	
37	1CE19CS040	JYOTHI SHREE S R	A database is to be constructed to keep track of all the entities and measures of Music School a) Select the business process for assignment. b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure
38	1CE19CS041	KAVANA B	
39	1CE19CS042	KEERTHI CHANDRA N L	
40	1CE19CS043	KEERTHI KUMARI	
41	1CE19CS044	KISHAN GOWDA	A database is to be constructed to keep track of all the entities and measures of Financial Industry (BANK) a) Select the business process for assignment b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure
42	1CE19CS045	KRITHIKA N KOUSHIK	
43	1CE19CS046	KRUTTIKA KIRANKUMAR BHOMKAR	
44	1CE19CS047	MANASA R	
45	1CE19CS048	MANOHAR M	A database is to be constructed to keep track of all the entities and measures of Ministry of State or Central Government. a) Select the business process for assignment. b) Draw the dimensional modelling for the same considering all the three schemas. c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure
46	1CE19CS049	MANOJ M K	
47	1CE19CS050	MANOJ R	
48	1CE19CS051	MARIA MONICA P	
49	1CE19CS052	MOHAMMED UZAIR BAIG	A database is to be constructed to keep track of all the entities and measures of Hospital Management a) Select the business process for assignment. b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure
50	1CE19CS056	MRUDULA S PRASAD	
51	1CE19CS058	NISHANTH NAYAKA N R	
52	1CE19CS059	NITHIN RAJ GOWDA	
53	1CE19CS076	SAIMA SHEIK	A database is to be constructed to keep track of all the entities and measures of Real Estate Management. a) Select the business process for assignment. b) Draw the dimensional modelling for the same considering all the three schemas. c) Enhance the dimension to increase the business. d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure.
54	1CE19CS081	SHANKARLINGA M MATTIMANI	
55	1CE19CS085	SPOORTHI H M	
56	1CE19CS092	SYED MUTAIB ULLA	
57	1CE19CS103	X SEMANTHA MERCY	
COMMON TO ALL STUDENTS			A database is to be constructed to keep track of all the entities and measures of Public Transport management System a)Select the business process for assignment b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

Kanakapura Road, near METRO Station, Doddakallasandra,
Bikasipura, Bengaluru, Karnataka 560062

Sl No	USN	Name of Student	Case Study
1	1CE19CS006	AMIR REHAN	A data base is being constructed to keep track of the teams and games of a sports league. A team has a number of players, not all of whom participate in each game. It is desired to keep track of the players participating in each game for each team, the positions they played in that game and the result of the game a. Select a business process from the above requirements b. Draw the dimensional modeling for the same c. Create an event tracking fact table for the business process and explain the same d. If the business analyzer is interested only with one particular game E.g cricket , how do you enhance your DM. write the cuboid structure for the same
2	1CE19CS011	ARTEE KUMARI R	
3	1CE19CS053	MOHAMMED SAMEER	
4	1CE19CS054	MONIKA J	
5	1CE19CS055	MRITUNJAY MISHRA	Suppose that a data warehouse for Big University consists of the following four dimensions: student, course, semester, and instructor, and two measures count and avg_grade. When at the lowest conceptual level (e.g., for a given student, course, semester, and instructor combination), the avg_grade measure stores the actual course grade of the student. At higher conceptual levels, avg_grade stores the average grade for the given combination. (a) Draw a snowflake schema diagram for the data warehouse (b) Starting with the base cuboid [student, course, semester, instructor], what specific OLAP operations (e.g., roll-up from semester to year) should one perform in order to list the average grade of CS courses for each Big University student (c) If each dimension has five levels (including all), such as "student < major < status < university < all", how many cuboids will this cube contain (including the base and apex cuboids)?
6	1CE19CS057	MULGE RAHUL KUMAR	
7	1CE19CS060	POOJA SURESH	
8	1CE19CS061	POOJASHREE K	
9	1CE19CS062	PRABHANJAN V KOLAR	Suppose that a data warehouse for Textile Industry consists of the following four dimensions: Textile Product, color, size, and texture. (a) Draw a snowflake schema diagram for the data warehouse. (b) Starting with the base cuboid (c) If each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)?
10	1CE19CS063	PRASHANTH K	
11	1CE19CS066	R FAZEELA FATHIMA	
12	1CE19CS067	RAHUL K R	
13	1CE19CS068	RAKSHANDA AIMAN GOLAND	A database is to be constructed to keep track of all the entities and measures of food industry a) Select the business process for assignment b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure
14	1CE19CS069	RAKSHITHA C R	
15	1CE19CS070	RAKSHITHA G M	
16	1CE19CS071	RATNADEEP ANIL MORE	
17	1CE19CS072	ROHIT GEHLOT	A database is to be constructed to keep track of all the entities and measures of Film industry a) Select the business process for assignment b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure
18	1CE19CS073	SACHIN H M	
19	1CE19CS074	SAGAR T R	
20	1CE19CS075	SAHANA GOPALKRISHNA HEB	
21	1CE19CS077	SALFIYA MUSKAN	A database is to be constructed to keep track of all the entities and measures of Employee Database a) Select the business process for assignment. b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure.
22	1CE19CS078	SAMBANGI SAITEJA	
23	1CE19CS079	SANGEETHA M S	
24	1CE19CS080	SHALINI R	
25	1CE19CS082	SHARADHI SHETTY D	A database is to be constructed to keep track of all the entities and measures of Zoo database. a) Select the business process for assignment b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure
26	1CE19CS083	SHIVAPRASAD M B	
27	1CE19CS084	SHIVARAJ HIREMATH	
28	1CE19CS086	SRISHTI SHARMA	
29	1CE19CS087	SRIVATSA S	A database is to be constructed to keep track of all the entities and measures of IT industry a) Select the business process for assignment b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business.
30	1CE19CS088	SRUSTI K G	
31	1CE19CS089	SUMAN S	

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

32	1CE19CS090	SUMMAIYA TAJ A	d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure.
33	1CE19CS091	SUMUKH K	A database is to be constructed to keep track of all the entities and measures of Library Management System. a) Select the business process for assignment. b) Draw the dimensional modelling for the same considering all the three schemas. c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure
34	1CE19CS094	TARUN G	
35	1CE19CS095	TAUQEER AHMED	
36	1CE19CS096	VEERESH BUDESHREDDY PA	
37	1CE19CS097	VEERKUMAR SOMANAGOWD/	A database is to be constructed to keep track of all the entities and measures of Music School. a) Select the business process for assignment. b) Draw the dimensional modelling for the same considering all the three schemas. c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure.
38	1CE19CS098	VIDYA D	
39	1CE19CS099	VINITHA V	
40	1CE19CS100	VISHNU P	
41	1CE19CS101	VISHRUTHA V	A database is to be constructed to keep track of all the entities and measures of Financial Industry (BANK) a) Select the business process for assignment b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure
42	1CE19CS102	VIVEK B U	
43	1CE18CS007	ANISHA SAMPANNA	
44	1CE18CS032	KAVANASAGAR H	
45	1CE18CS038	LAKSHMEESH D	A database is to be constructed to keep track of all the entities and measures of Ministry of State or Central Government. a) Select the business process for assignment b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure.
46	1CE18CS043	MEZY SANDRA DSOUZA	
47	1CE18CS051	NIRANJAN M	
48	1CE18CS063	RAHULKUMAR	
49	1CE18CS066	SAHANA R	A database is to be constructed to keep track of all the entities and measures of Hospital Management a) Select the business process for assignment b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure.
50	1CE18CS072	SHILPA N	
51	1CE18CS074	SHRAAVYA S	
52	1CE18CS076	SHREYS B S GOWDA	
53	1CE18CS077	SHREYAS V	A database is to be constructed to keep track of all the entities and measures of Real Estate Management a) Select the business process for assignment. b) Draw the dimensional modelling for the same considering all the three schemas. c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure
54	1CE18CS091	ULLAS M	
55	1CE18CS096	VARSHA H	
56	1CE20CS400	ARCHANA .C	
57	1CE20CS401	PRADEEP K S	
COMMON TO ALL STUDENTS			A database is to be constructed to keep track of all the entities and measures of Public Transport management System a)Select the business process for assignment b) Draw the dimensional modelling for the same considering all the three schemas c) Enhance the dimension to increase the business d) Starting with the base cuboid, if each dimension has five levels (including all), how many cuboids will this cube contain (including the base and apex cuboids)? Draw the cuboid structure.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN | 1 | C | E | 1 | | C | S | | | | COURSE CODE:18CS641

CITY ENGINEERING COLLEGE

Kanakapura Road, Doddakallasandra, Bengaluru - 560062

FIRST INTERNAL TEST

Programme: Computer Science & Engineering Date: 17/05/2022
Course Name: Data Mining & Data Warehouse Time: 2:30PM – 4:00 PM
Sem: 6
Duration: 1 ½ Hrs MAX MARKS: 50

Note: 1)Answer any FIVE questions choosing at least ONE from each Part.
2)Diagrams carry marks. Draw neat labeled diagrams wherever required.

		Marks	CO 1	BTL
	Part A			
1.	What is a data warehouse? Discuss key features.	10	CO1	BT2
	Or			
2.	What is a data cube measure? Explain how data cube measures are categorized.	10	CO1	BT2
	Part B			
3.	With a neat labelled diagram explain the Multitiered Architecture of data warehousing.	10	CO1	BT2
	Or			
4.	Differentiate in detail between OLAP and OLTP	10	CO1	BT2
	Part C			
5.	Explain in detail the ETL process.	10	CO1	BT2
	Or			
6.	What is Metadata? Discuss different types of metadata used in Data Warehouse.	10	CO1	BT2
	Part D			
7.	Explain the different data warehouse models with examples	10	CO1	BT2
	Or			
8	Explain the following operations of Datacube with suitable examples : (i) Roll-Up (ii) Drill Down	10	CO1	BT2
	Part E			
9.	What is meant by the curse of Dimensionality? Also Differentiate between ROLAP, MOLAP and HOLAP servers	10	CO1	BT2
	Or			
10	Explain the different indexing methods used in OLAP data.	10	CO1	BT2

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Course Outcomes (COs):

1) Identify data mining problems and implement the data warehouse
2) Write association rules for a given data pattern.
3) Choose between classification and clustering solution.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

Kanakapura Rd, near METRO Station, Doddakallasandra, Bikasipura,
Bengaluru, 560062

SCHEME & SOLUTION FOR VALUATION

INTERNAL TEST 1

SEMESTER VI **SECTION A & B**

SUBJECT CODE : 18CS641 **Date of Test: 17th May 2022**

SUBJECT TITLE : Data Mining and Data Warehousing

Q #	SOLUTION	Marks Distribution	Total Marks
1	**What is a data warehouse? Discuss key features.** A data warehouse is a collection of integrated databases designed to support a **Decision Support System**. Decision support systems are used in many industries. Example: GPS route planning. A DSS can be used to plan the fastest and best routes between two points by analyzing the available options. These systems often include the capability to monitor traffic in real-time to route around congestion. It is a collection of integrated, subject-oriented databases designed to support the DSS function, where each unit of data is non-volatile and relevant to some moment in time. **Key features**: **Subject-Oriented:** A data warehouse can be used to analyze a particular subject area. For example, "sales" can be a particular subject. **Integrated:** A data warehouse integrates data from multiple data sources. For example, source A and source B may have different ways of identifying a product, but in a data warehouse, there will be onlya single way of identifying a product. **Time-Variant**: Historical data is kept in a data warehouse. For example, one can retrieve data from 3 months, 6 months, 12 months, or even older data from a data warehouse. This contrasts with a transactions system, where often only the most recent data is	Explanation 5M + 5 M	10 M

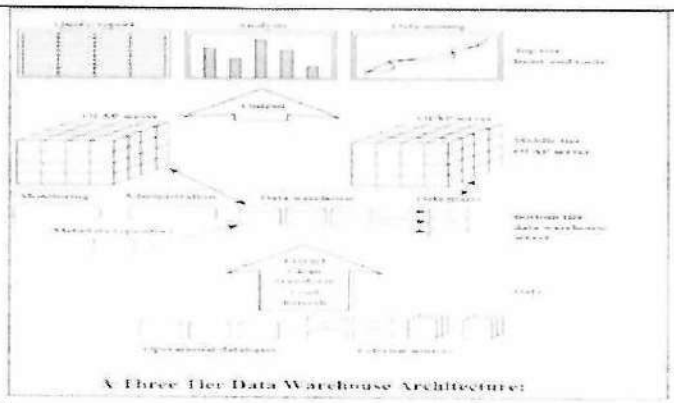
ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

	kept. For example, a transaction system may hold the most recent address of a customer, where a data warehouse can hold all addresses associated witha customer. **Non-volatile:** Once data is in the data warehouse, it will not change. So, historical data in a data warehouse should never be altered.		
2	**What is a data cube measure? Explain how data cube measures are categorized.** 1) A data cube measure is a numeric function that can be evaluated at each point in the data cube space. 2) A measure value is computed for a given point by aggregating the data corresponding to the respective dimension–value pairs defining the given point. 3) Measures can be organized into three categories—distributive, algebraic, and holistic based on the kind of aggregate functions used. **Distributive:** if the result derived by applying the function to *n* aggregate values is the same as that derived by applying the function on all the data without partitioning E.g., count(), sum(), min(), max() **Algebraic:** if it can be computed by an algebraic function with *M* arguments (where *M* is a bounded integer), each of which is obtained by applying a distributive aggregate function E.g., avg(), min_N(), standard_deviation() **Holistic:** if there is no constant bound on the storage size needed to describe a subaggregate. E.g., median(), mode(), rank()	Explanation 5M + 5 M	10 M
3	**With a neat labelled diagram explain the Multitiered Architecture of data warehousing.**	Diagram – 5M Explanation - 5 M	10

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061



A Three Tier Data Warehouse Architecture:

Tier 1:

The bottom tier is a warehouse database server that is almost always a relational database system. Back-end tools and utilities are used to feed data into the bottom tier from operational databases or other external sources (such as customer profile information provided by external consultants). These tools and utilities perform data extraction, cleaning, and transformation (e.g., to merge similar data from different sources into a unified format), as well as load and refresh functions to update the data warehouse . The data are extracted using application program interfaces known as gateways. A gateway is supported by theunderlying DBMS and allows client programs to generate SQL code to be executed at a server.

Tier-2:

The middle tier is an OLAP server that is typically implemented using either a relational OLAP (ROLAP)model or a multidimensional OLAP.

OLAP model is an extended relational DBMS that maps operations on multidimensional data tostandard relational operations.

A multidimensional OLAP (MOLAP) model, that is, a special-purpose server that directlyimplements multidimensional data and operations.

Tier-3:

The top tier is a front-end client layer, which contains query and reporting tools, analysistools, and/or data mining tools (e.g., trend analysis, prediction, and so on).

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

4	**Differentiate in detail between OLAP and OLTP** | Feature	OLTP	OLAP | | --- | --- | --- | | Characteristic | operational processing | informational processing | | Orientation | transaction | analysis | | User | clerk, DBA, database professional | knowledge worker (e.g., manager, executive, analyst) | | Function | day to day operations | long term informational requirements, decision support | | DB design | ER based, application oriented | star/snowflake, subject oriented | | Data | current, guarantees up to date | historical, accuracy maintained over time | | Summarization | primitive, highly detailed | summarized, consolidated | | View | detailed, flat relational | summarized, multidimensional | | Unit of work | short, simple transaction | complex query | | Access | read/write | mostly read | | Focus | data in | information out | | Operations | index/hash on primary key | lots of scans | | Number of records accessed | tens | millions | | Number of users | thousands | hundreds | | DB size | GB to high order GB | ≥ TB | | Priority | high performance, high availability | high flexibility, end-user autonomy | | Metric | transaction throughput | query throughput, response time |	Tabular column Explanation : 1*10 =10M	10M
5	**Explain in detail the ETL process.** **Extraction, Transformation, and Loading** Data warehouse systems use back-end tools and utilities to populate and refresh their data These tools and utilities include the following functions: **Data extraction**, which typically gathers data from multiple, heterogeneous, and external sources. **Data cleaning**, which detects errors in the data and rectifies them when possible. **Data transformation**, which converts data from legacy or host format to warehouse format. **Load**, which sorts, summarizes, consolidates, computes views, checks integrity, and builds indices and partitions. **Refresh**, which propagates the updates from the data sources to the warehouse.	5X2=10	10M
6	**What is Metadata? Discuss different types of metadata used in Data Warehouse.** **Meta Data Repository:** Metadata are data about data. When used in a data warehouse, metadata are the data that define warehouse objects. Metadata are created for the data names and definitions of the given warehouse. Additional metadata are created and captured for time stamping any extracted data, the source of the extracted data, and missing fields that have been added by data cleaning or integration processes. A metadata repository should contain the following:	2*5 =10M	10M

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

	• A description of the structure of the data warehouse, which includes the warehouse schema, view, dimensions, hierarchies, and derived data definitions, as well as data mart locations and contents. • Operational metadata, which include data lineage (history of migrated data and the sequence of transformations applied to it), currency of data (active, archived, or purged), and monitoring information (warehouse usage statistics, error reports, and audit trails). • The algorithms used for summarization, which include measure and dimension definition algorithms, data on granularity, partitions, subject areas, aggregation, summarization, and predefined queries and reports. • The mapping from the operational environment to the data warehouse, which includes source databases and their contents, gateway descriptions, data partitions, data extraction, cleaning, transformation rules and defaults, data refresh and purging rules, and security (user authorization and access control). • Data related to system performance, which include indices and profiles that improve data access and retrieval performance, in addition to rules for the timing and scheduling of refresh, update, and replication cycles. • Business metadata, which include business terms and definitions, wnership information, and charging policies.		
7	**Explain the different data warehouse models with examples.** **Three Data Warehouse Models** **Enterprise warehouse** collects all of the information about subjects spanning the entire organization **Data Mart** a subset of corporate-wide data that is of value to a specific groups of users. Its scope is confined to specific, selected groups, such as marketing data mart Independent vs. dependent (directly from warehouse) data mart **Virtual warehouse** A set of views over operational databases Only some of the possible summary views may be materialized	**Explanation** **4+3+3 = 10 M**	**10M**

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

8	**Explain the following operations of Datacube with suitable examples : (i) Roll-Up (ii) Drill Down** **ROLL-UP** This is like zooming-out on the data-cube This is required when the user needs further abstraction or less detail. Initially, the location-hierarchy was "street < city < province < country". On rolling up, the data is aggregated by ascending the location-hierarchy from the level-of city to level-of- country. **DRILL DOWN** This is like zooming-in on the data. This is the reverse of roll-up. This is an appropriate operation → when the user needs further details or → when the user wants to partition more finely or → when the user wants to focus on some particular values of certain dimensions. This adds more details to the data. • Initially, the time-hierarchy was "day < month < quarter < year". On drill-up, the time dimension is descended from the level-of-quarter to the level-of-month.	**Explanation –** **5X2= 10M**	**10M**
9	**What is meant by the curse of Dimensionality? Also Differentiate between ROLAP, MOLAP and HOLAP servers** **OLAP Server Architectures** **Relational OLAP (ROLAP)** 1) Use relational or extended-relational DBMS to store and manage warehouse data and OLAP middle ware 2) Include optimization of DBMS backend, implementation of aggregation navigation logic, and additional tools and services 3) Greater scalability **Multidimensional OLAP (MOLAP)** 1) Sparse array-based multidimensional storage engine 2) Fast indexing to pre-computed summarized data **Hybrid OLAP (HOLAP) (e.g., Microsoft SQLServer)** 1) Flexibility, e.g., low level: relational, high-level: array 2) Specialized SQL servers (e.g., Redbricks) Specialized support for SQL queries over star/snowflake sch.	**Explanation** **5+5 = 10 M**	**10M**

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

10	**Explain the different indexing methods used in OLAP data.** **Indexing OLAP Data: Bitmap Index** 1) Index on a particular column 2) Each value in the column has a bit vector: bit-op is fast 3) The length of the bit vector: # of records in the base table 4) The *i*-th bit is set if the *i*-th row of the base table has the value for the indexed column 5) not suitable for high cardinality domains 6) A recent bit compression technique, Word-Aligned Hybrid (WAH), makes it work for high cardinality domain	Explanation 5*2 = 10 M	10M

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

VI Sem Section 'A'

Professional elective
18CS641

DM DW

MON: 12.20 pm to 1.10 pm
TUE: 12.20 pm to 1.10 pm
WED: 11.30 am to 12.20 pm

ATTENDANCE

Sl. No.	Reg.No. ICE19CS	Name	4	6	11	12	13	18	19	20	25	26	27	27	20	20
			4	4	4	4	4	4	4	4	4	4	4	4	5	5
			1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	001	Aakash T.E.	A	1	2	3	4	5	6	7	8	A	9	10	11	12
2	002	Achyuth Mahesh Hegde	A	1	2	3	4	5	6	A	7	8	9	10	11	12
3	003	Afrid Pasha H.P.	A	1	2	3	4	5	6	7	8	9	10	11	12	A
4	004	Aishwarya B.M.	A	1	2	3	4	5	6	7	8	9	10	11	12	13
5	005	Aishwarya C	A	A	1	2	3	4	5	6	7	8	9	10	11	12
6	007	Amith Singh M	A	1	2	3	4	5	6	7	8	9	10	11	12	A
7	008	Ananya Bhambore	A	1	2	3	4	5	6	7	8	9	10	11	12	13
8	009	Apoorva R Shet	A	1	2	3	4	5	6	7	8	A	9	10	11	12
9	010	Arshad ulla Z.	A	1	2	A	3	4	5	6	7	8	9	10	11	12
10	011	Arlee Kumari R	A	1	2	3	4	5	6	changed to 'B' section						
11	012	Ashwini. B	1	2	3	4	5	6	7	8	9	10	11	12	13	14
12	013	B.M. Puneeth	A	1	2	3	4	5	6	7	8	9	10	11	12	13
13	014	Bhanu Prakash. R.	A	A	1	2	3	4	5	6	7	8	9	10	11	12
14	015	Bhavana. S.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	016	Bholay Nath Singh	A	A	A	A	A	1	2	3	4	5	6	7	8	9
16	017	Buidushree. G.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
17	018	Chandan Kumar. C.	A	1	2	3	4	5	6	7	8	9	10	11	A	12
18	019	Chandana D.Y.	A	A	1	2	3	4	5	6	7	8	9	10	11	12
19	020	Chandini R.P.	A	1	2	3	4	5	6	7	8	9	10	11	12	13
20	021	Charan Simha. D.	A	1	2	3	4	5	6	A	7	8	9	10	11	12
21	022	Chelan. S.	A	1	2	3	A	4	5	6	7	8	9	10	11	12
22	023	Chelan. R	A	1	2	3	4	5	6	7	8	A	A	9	10	11
23	024	Chelan Raj. H.	A	1	2	3	4	5	6	7	8	9	10	11	12	13
24	025	Chiranjeevi. V.	A	1	A	2	3	4	5	6	7	8	9	10	11	12
25	026	Darshan. K.	A	1	2	3	4	5	6	7	A	8	9	10	11	12
	No. of Abs.	ATTESTED COPY														
	Initials															

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ATTENDANCE

Sl. No.	Reg.No. 1CE19CS		4	6	11	12	13	18	19	20	25	26	27	27	20	20
			4	4	4	4	4	4	4	4	4	4	4	4	5	5
			1	2	3	4	5	6	7	8	9	10	11	12	13	14
26	027	Deepak Jadan	1	2	3	4	5	6	7	8	9	10	11	12	13	14
27	028	Deepthi Rashmi R	1	2	3	4	5	6	7	8	9	10	11	12	13	14
28	029	Dhanush. S.	A	1	2	3	4	5	A	6	7	8	9	10	11	12
29	030	Divya S.A	A	1	2	3	4	5	6	7	8	9	10	11	12	13
30	031	Fozail Ahmed	1	2	3	4	5	6	7	8	9	10	11	12	13	14
31	032	Geethansh P	A	1	2	3	4	5	6	7	8	9	10	11	12	13
32	033	Harish Babu KP	A	1	2	3	4	5	6	7	8	A	A	9	10	11
33	034	Harshith G.R.	A	1	2	3	4	5	6	7	8	9	A	10	11	12
34	035	Hemanth V	A	1	2	3	4	5	A	6	7	8	9	10	11	12
35	037	Iqra Fatima	1	2	3	4	5	6	7	8	10	10	11	12	13	14
36	038	Jaaneshwar DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14
37	039	Jeevan M	A	1	2	3	4	A	5	6	7	8	9	10	11	12
38	040	Jyothi shree SR	A	1	2	3	A	4	5	6	7	8	A	9	10	11
39	041	Kavana. B.	A	1	2	3	A	4	5	6	7	8	9	10	A	11
40	042	Keerthi chandra NL	A	A	1	2	3	4	5	6	7	8	9	10	11	12
41	043	Keerthi Kumari	A	1	2	3	4	5	A	A	6	7	8	9	10	11
42	044	Kishan Gowda	A	1	2	3	4	5	6	7	8	9	10	11	12	13
43	045	Kshitika N. Kaushik	A	1	2	3	4	5	6	7	8	9	10	11	12	13
44	046	Kruthika K. Bhonkar	A	1	2	3	4	5	6	7	8	9	10	11	12	13
45	047	Manasa. R.	A	1	2	3	4	5	6	7	8	9	10	A	11	12
46	048	Manohar. M.	A	A	A	1	2	3	4	5	6	7	8	9	10	11
47	049	Manoj M.K.	A	A	A	1	2	3	A	5	6	7	8	9	10	11
48	050	Monoj R.	A	1	2	3	4	5	6	7	8	9	10	11	12	13
49	051	Maria Monica P	A	1	2	3	4	5	6	7	8	9	10	11	12	13
50	052	Mohammed Uzair Baig	A	A	A	1	2	3	4	5	6	7	8	9	10	11
	No. of Abs.															
	Initials															

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ATTENDANCE

Sl. No.	Reg.No. 1CE19CS	Name	4	6	11	12	13	18	19	20	25	26	27	27	20	20
			4	4	4	4	4	4	4.	4	4	4	4	4	5	5
			1	2	3	4	5	6	7	8	9	10	11	12	13	14
51	056	Mridula S. Prasad	1	2	3	4	5	6	7	8	9	10	11	12	13	14
52	058	Nishanth Nayaka NR	A	A	1	2	3	4	5	6	7	8	9	10	11	12
53	076	Saima Sheik	A	A	1	2	3	4	5	6	7	8	9	10	11	12
54	081	Shankarlinga Maltinani	A	A	1	2	3	4	5	6	7	8	9	10	11	12
55	085	Spoorthi. H M	A	1	2	3	4	5	6	7	8	9	10	11	12	13
56	092	Syed Mutaib ulla	A	1	2	3	4	5	6	7	8	9	10	11	12	13
57	103	Semantha Mercy.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
58																
59																
60																
61																
62																
63																
64																
65																
66																
67																
68																
69																
70																
71																
72																
73																
74		ATTESTED COPY														
75																
	No. of Abs.															
	Initials	PRINCIPAL CITY ENGINEERING COLLEGE Kanakapura Main Road, Bangalore-560061														

ATTENDANCE

Sl. No.	Reg.No. 1CE19CS	Name	23	24	25	30	31	1	6	7	8	20	21	27	27	28	28
			5	5	5	5	5	6	6	6	6	6	6	6	6	6	6
			15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
51	056	Mridula S. Prasad	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
52	058	Nishanth Nayaka NP	13	14	15	16	A	A	17	18	19	20	21	22	23	24	25
53	076	Saima Sheik	13	14	A	15	16	17	18	A	19	20	21	22	23	24	25
54	081	Shankarlinga Maltim	13	14	15	16	17	18	19	A	20	21	22	23	24	25	26
55	085	Spoorthi. HM	14	15	16	17	18	19	20	A	21	22	23	24	25	26	27
56	092	Syed Mutaib ulla	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
57	103	Semantha Mercy.	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
58																	
59																	
60																	
61																	
62																	
63																	
64																	
65																	
66																	
67																	
68																	
69																	
70																	
71																	
72																	
73																	
74																	
75																	
	No. of Abs.																
	Initials																

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ATTENDANCE

Sl. No.	Reg.No. 1CE19CS	Name	29/6/30	29/6/31	30/6/32	30/6/33	4/7/34	5/7/35	5/7/36	6/7/37
51	056	Mridula S. Prasad	30	31	32	33	34	35	36	37
52	058	Nishanth Nayaka N R	26	27	28	29	30	31	32	33
53	076	Saima Sheik	26	27	28	29	30	31	32	33
54	081	Shankarlinga Maltinr	27	28	29	30	31	32	33	34
55	085	Spoorthi. H M	28	29	30	31	32	33	34	35
56	092	Syed Mutaib ulla	29	30	31	32	33	34	35	36
57	103	Semantha Mercy.	30	31	32	33	34	35	36	37
58										
59										
60										
61										
62										
63										
64										
65										
66										
67										
68										
69										
70										
71										
72										
73										
74										
75										
	No. of Abs.									
	Initials									

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

VI SEM 'A' SECTION PROFESSIONAL ELECTIVE

18CS641

DM DW

RECORD OF CLASS WORK

Date	Period	Topics Covered
4/4/22	3	Insight into DM & DW - Applications & Career Perspective, Syllabus, Prerequisite and Text books.
5/4/22	4.	NO class - Placement talk.
6/4/22	3	Introduction to DW, Basics, defn ODS, OLAP, OLTP
11/4/22	4	Multitier architecture.
12/4/22	4	Data warehouse model - Enterprise, Virtual & Data Mart.
13/4/22	3	ETL Techniques, Data Cube
18/4/22	4	Multidimensional data model, Measures.
19/4/22	4	Measure categorisation & computation.
20/4/22	3	Mathematical schemas - Star with eg.
25/4/22	4	Snowflake schema with eg.
26/4/22	4	Fact constellation with e.g.
27/4/22	(Mod:2) 3	Schema egs: & Hierachies, OLAP op.
2/5/22		Holiday - Ramzan.
3/5/22		Holiday - Basava Jayanthi.
4/5 - 5/5		Hands on workshop:
9/5 - 11/5		Applied CL.
20/5/22	5,6 (Module 2) (2hrs)	Indexing methods & Issues in Data warehouse.
		(IA1 - 16/5/22 - 18/5/22)

RECORD OF CLASS WORK

Date	Period	Topics Covered
		MODULE - 2.
23/5/22	4	Introduction to DM - tasks, challenges types, data quality.
24/5/22	4	Data Preprocessing.
25/5/22	3	Proximity Measures - Euclidean, Minkowski with problems.
30/5/22	4	Proximity Measures - Binary vectors, Documents, correlation.
31/5/22	4	Pbs. on Proximity measures from VTU QPs, case studies (DM)
	Module - 3. 3	Association Analysis: Defn & Basics, Introduction.
1/6/22		
6/6/22	4	Frequent Item set gen. Examples. FP tree growth. Evaluation
7/6/22	4	Rules generation, alternate methods, Examples.
8/6/22.	3	Lattice diagram and inference Pruning of candidate sets.
13/6/22	to 15/6/22	IA - 2.
	Module - 4	Clustering Analysis: Overview, application & Introduction.
20/6/22	4	K - means algo & Pbs.
21/6/22	4	Hierarchical clustering,
27/6/22	3	Min & Max linkages, Pbs.
(2hrs).	4	DB scan and density based clustering

Teachers Signature

HOD'S Signature

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Teachers Signature

HOD'S Signature

VI Sem 'A' & 'B' Section. 18CS641 DMDW.

[A] MON : 12.20 to 1.10 (4)
TUE : 12.20 to 1.10 (4)
WED : 11.30 to 12.20 (3)

[B] MON : 11.30 to 12.20 (3)
TUE : 11.30 to 12.20 (3)
WED : 12.20 to 1.10 (4)

LESSON PLAN

Week	Date From	Date To	Topics Planned
I	4/4/22	6/4/22	Data Warehousing & Modelling. Basic concepts, Multitier architecture, Data Ware models, Enterprise warehouse :- MODULE - 1
II	11/4/22	13/4/22	Data mart and Virtual Ware house, ETL methods.
III	18/4/22	20/4/22	Data cube: Multidimensional data model. Measures. Categorisation & Computation.
IV	25/4/22	27/4/22	Schemas: Star, Snowflakes, Fact constellation, Examples, The concept of Hierarchies.
V	2/5/22	4/5/22	Typical OLAP operations. Activity on analyzing schema for different data warehouse.
VI	9/5/22	11/5/22	MODULE : 2 Efficient data cube, Types of indexing, OLAP queries, OLAP server archi, ROLAP, MOLAP, HOLAP.
VII	16/5/22	18/5/22	IA - 1
VIII	23/5/22	25/5/22	Introduction to Data Mining, challenges, Tasks, Data types, Data Quality, Data Preprocessing, Proximity measures - Pbs.

LESSON PLAN

Week	Date From	Date To	Topics Planned
			MODULE - 3.
IX	30/5/22	1/6/22	Problems on Proximity Measures. Association analysis - Pb. diff. Freq. item set gen. Rule gen. Alternate methods.
X	6/6/22	8/6/22	FP growth algo, Eval. of Assoc. patterns; Pbs. on Module 3.
XI	13/6/22	15/6/22	IA - 2
XII	20/6/22	22/6/22	Module : 4 - clustering analysis Overview & algo, K Means, Agglomer Hierarchial clustering, DB Scan, Density Based clustering.
XIII	27/6/22	29/6/22	Graph based clustering, Scalabl Pbs. on clustering and Quiz, Cross word puzzle.
XIV	4/7/22	6/7/22	Module 5 :- Classification Decision trees, Induction, Compar classifiers, Rule based classifiers
XV	11/7/22	13/7/22	Nearest Neighbour, Bayesian classifiers. Pbs. on KNN & Bayesian classifiers.
XVI			IA - 3 & Lab Internals.

Vagdevi
Teachers Signature

ATTESTED COPY

HOD's Signature

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CIRCULAR

Ref. No: CEC/CSE/DAC/2021-2022/01 **Date: 20-09-2021**

All the members of Department Advisory Committee are informed to attend a meeting which will be held as follows

Date: 25-09-2021
Time: 03.30 PM
Venue: LAB C104

Agenda:

- Discussion on New Education Policy (NEP 2020)
- Conducting Add-on Course and soft skill training
- Faculty development programme
- Conducting coding, debugging events

Mr. Vivekavardhana Reddy

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Department Advisory Committee Meeting

Date: 25-09-2021
Time: 03.30 PM
Venue: Room No. C104

DAC Members Present:

Sl. No	Member Name	Designation	Role	Sign
1	Mr. Vivekavardhana Reddy	HOD	Convenor	
2	Dr. Nandakumar A N	Professor	Member	
3	Dr. Y S Kumaraswamy	Professor	Member	
4	Dr. Sowmya Naik P T	Professor	Co-Convenor	
5	Mrs. Ambika P R	Assistant Professor	Member	
6	Mrs. Laxmi M C	Assistant Professor	Member	
7	Mr. Girish G A	Assistant Professor	Member	
8	Mrs. Archana Bhat	Assistant Professor	Member	
9	Mr. Vinodh Kumar S	Assistant Professor	Member	
10	Mr. Narasimha Prasad K L	Project Manager, Accenture Services Pvt. Ltd	Alumni (Industry Expert)	
11	Mr. Devraj K	Founder & CEO, EtherScale	Alumni	

The Department Advisory Committee meeting was conducted at Department of CSE, on 25th September 2021, at 03:30 PM.

Agenda of the Meeting:

- Discussion on New Education Policy (NEP 2020)
- Conducting Add-on Course and soft skill training
- Faculty development programme
- Conducting coding, debugging events

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

Minutes of Meeting:

In the Department Advisory Committee meeting, an overview of the department was presented, emphasizing student achievements, result analysis, and faculty accomplishments. The members discussed various suggestions for improvement and reviewed the meeting agenda.

The Committee proposed the following items for inclusion in the agenda:

- The HOD briefed the team about the new education policy, emphasizing the importance of faculty awareness regarding upcoming government initiatives under the NEP. Consequently, it was decided to organize a Faculty Development Program focused on the new education policy.
- A recommendation was made to introduce a certificate course in Ethical Hacking, which aims to not only enhance students' programming skills but also deepen their understanding of this advanced subject. Additionally, the need for soft skills development was discussed.
- The HOD also proposed a 9-day coding and debugging event to further engage students in practical learning.
- During the meeting, it was agreed that a group of faculty members would prepare MCQs for various programming languages, which would then be shared with students to improve their programming proficiency.

Mr. Vivekavardhana Reddy

HOD & Convenor

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Academic Calendar for ODD Semester of UG programmes for year 2021-22

	V semester B.E./B.Tech.	V semester B.Arch./ B.Plan.	VII semester B.E./B.Tech.	VII semester B.Plan./B.Arch	IX semester B.Arch	III semester B.E./ B.Tech.	III Semester B.Arch.	III semester B. Plan	I semester B.E./B.Tech.	I semester B.Arch/B.Plan
Commencement of ODD Semester	01.10.2021	01.10.2021	01.10.2021	01.10.2021	01.10.2021	18.10.2021	18.10.2021	18.10.2021	Will be announced later	
Last Working day of ODD Semester	31.01.2022	31.01.2022	31.01.2022	31.01.2022	31.01.2022	19.02.2022	19.02.2022	19.02.2022		
Practical Examination	01.02.2022 To 10.02.2022	01.02.2022 To 10.02.2022	01.02.2022 To 10.02.2022	01.02.2022 To 10.02.2022	---	21.02.2022 To 04.03.2022	21.02.2022 To 04.03.2022	21.02.2022 To 04.03.2022		
Theory Examinations	11.02.2022 To 25.03.2022	11.02.2022 To 25.03.2022	11.02.2022 To 25.03.2022	11.02.2022 To 25.03.2022	---	07.03.2022 To 25.03.2022	07.03.2022 To 25.03.2022	07.03.2022 To 25.03.2022		
Internship	---	---	---	---	---	---	---	---		
Internship Viva Voce/ Project viva	---	---	---	---	---	---	---	---		
Summer Project / Professional training / Organization Study	---	---	---	---	---	---	---	---		
Submission of the report to University	---	---	---	---	---	---	---	---		
Commencement of EVEN Semester	04.04.2022	04.04.2022	04.04.2022	04.04.2022`	07.02.2022	11.04.2022	11.04.2022	11.04.2022		

Please Note:

- The academic sessions for ODD semesters should commence from the **dates mentioned** above.
- The Institute needs to function for **six days** a week with additional hours (**Saturday is a full working day).** #if required the college can plan to have extra classes even on Sundays also.
- Faculty should conduction additional tutorial classes ONLINE to solve the doubts of the students.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by MHRD/UGC/AICTE/State Government.
- Academic Calendar is also applicable for **Autonomous Colleges.** In case if any changes are to be effected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.
- The offline classes may be conducted either by **staggering** the timings in 02 sessions in a day with 50% capacity for each session or full day session with 50% capacity on alternative days, following all SOPs.
- The college has to conduct offline classes to cover **80%** of the syllabus of the courses; however, **20%** of the syllabus can be covered in virtual (Online) mode. **Attendance** of the students' for offline and online classes is mandatory and record should be maintained and submitted to university whenever informed.
- Students joining to VII semester B.E./B.Tech., should complete the **Internship** before the commencement of the classes.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

REGISTRAR

CITY ENGINEERING COLLEGE BENGALURU-560061. ACADEMIC CALENDAR 2021-22 (ODD SEM)

DAY	Date	OCTOBER	Date	NOVEMBER	Date	DECEMBER	Date	JANUARY	Date	FEBRUARY
FRI	1	Starting of 5th & 7th Semesters								
SAT	2	GANDHI JAYANTI (DH)								
SUN	3						1			
MON	4		1	KANNADA RAJYOTSAVA (DH)			2		1	
TUE	5		2				3		2	
WED	6	MAHALAYA AMAVASYA (DH)	3	NARAKACHATURDASHI (DH)	1		4		3	
THU	7		4		2		5		4	
FRI	8		5	DEEPAVALI (DH)	3		6		5	
SAT	9	2ND SATURDAY HOLIDAY	6		4		7		6	
SUN	10		7		5		8	2ND SATURDAY HOLIDAY	7	
MON	11		8	FIRST INTERNAL ASSESSMENT 5th & 7th Semesters	6	SECOND INTERNAL ASSESSMENT 5th & 7th Semesters	9		8	THIRD INTERNAL ASSESSMENT For 3rd sem
TUE	12		9		7		10	THIRD INTERNAL ASSESSMENT 5th & 7th Semesters	9	
WED	13		10		8		11		10	
THU	14	AYUDHA PUJA (DH)	11		9		12		11	Last Working day of 3rd Semester 19.02.2022
FRI	15	VIJAYADASHAMI (DH)	12		10		13		12	
SAT	16		13	2ND SATURDAY HOLIDAY	11	2ND SATURDAY HOLIDAY	14	MILADUNNABI (DH)	13	
SUN	17		14		12		15		14	VTU Practical Exams 01.02.2022 To 10.02.2022 5th & 7th Semesters
MON	18	Starting of 3rd Semester	15		13		16		15	
TUE	19	Id Meelad (DH)	16		14		17		16	
WED	20	VALMIKI JAYANTHI (DH)	17		15		18		17	VTU Theory Exams for 5th & 7th Semesters 11.02.2022 To 25.03.2022
THU	21		18		16		19		18	
FRI	22		19		17		20		19	
SAT	23	4TH SATURDAY HOLIDAY	20	ALUMNI MEET & GRADUATION DAY	18		21		20	
SUN	24		21		19		22	4TH SATURDAY HOLIDAY	21	VTU Practical Exams For 3rd sem 21.02.2022 To 04.03.2022
MON	25		22	KANAKA JAYANTHI (DH)	20		23		22	
TUE	26		23		21		24		23	
WED	27		24	FIRST INTERNAL ASSESSMENT 3rd Semester	22		25		24	VTU Theory Exams for 3rd sem 07.03.2022 To 25.03.2022
THU	28		25		23		26	RATHOTSAVA (DH)	25	
FRI	29		26		24		27		26	
SAT	30		27	4TH SATURDAY HOLIDAY	25	4TH SATURDAY HOLIDAY	28		27	
SUN	31		28		26		29		28	
MON			29		27	SECOND INTERNAL ASSESSMENT 3rd Semester	30			Commencement of EVEN Semester for 6th & 8th sem is 04.04.2022 and For 4th sem is 11.04.2022
TUE			30		28		31	Last Working day of 5th & 7th Sem		
WED					29					
THU					30					
FRI					31					

Note: First Semester STARTING DATE will be announced later

ATTESTED COPY

Principal
City Engineering College,
Bangalore-560 061

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE DEPARTMENT OF CSE ACADEMIC CALENDAR 2021-22 (ODD SEM)

DAY	Date	OCTOBER	Date	NOVEMBER	Date	DECEMBER	Date	JANUARY	Date	FEBRUARY	Date	MARCH	APRIL
FRI	1	**STARTING OF 5th & 7th Semesters**											
SAT	2	GANDHI JAYANTI(DH)					1						
SUN	3						2			**VTU PracticalExams 01.02.2022 To 10.02.2022 5th & 7th Semesters**			
MON	4		1	KANNADA RAJYOTSAVA(DH)			3						
TUE	5		2				4		1		1		
WED	6	MAHALAYA AMAVASYA(DH)	3	NARAKA CHATURDASHI(DH)	1		5		2		2		
THU	7		4		2		6		3		3		
FRI	8		5	DEEPAVALI(DH)	3		7		4		4		
SAT	9	2ND SAT HOLIDAY	6		4		8	2ND SAT HOLIDAY	5		5		
SUN	10		7		5		9		6		6		
MON	11		8	**FIRST INTERNAL ASSESSMENT 5th & 7th Semesters**	6	**SECOND INTERNAL ASSESSMENT 5th & 7th Semesters**	10		7		7		
TUE	12		9		7		11		8		8		
WED	13		10		8		12		9	**SECOND INTERNAL ASSESSMENT 3rd Semester**	9		
THU	14	AYUDHA PUJA(DH)	11		9		13		10		10	THIRD INTERNAL ASSESSMENT For 3rd sem 17,18,19	
FRI	15	VIJAYA DASHAMI(DH)	12		10		14		11		11		
SAT	16		13	2ND SATURDAY HOLIDAY	11	2ND SAT HOLIDAY	15		12		12		
SUN	17		14		12		16		13		13		
MON	18	**STARTING OF 3rd Semester**	15		13	STARTING OF1st Semester	17		14	VTU Theory Exams for 5th & 7th Semesters 11.02.2022 To 25.03.2022	14		
TUE	19	Id Meelad(DH)	16		14		18		15		15	Lab internals for 3RD 7Sem 21ST TO 24TH Last Working day of 3rdSemester 25.03.2022 VTU Practical Exams For 3rd sem REGULAR 28.03.2022 To 31.03.2022 VTU Practical Exams For 3rd sem LATERAL 21.04.2022 To 26.04.2022 Theory Exams for 3rd sem 01.04.2022 To 20.04.2022	
WED	20	VALMIKI JAYANTHI(DH)	17		15		19		16		16		
THU	21		18		16		20		17		17		
FRI	22		19		17		21		18	Last Working day of 1st Semester	18		
SAT	23	4TH SATURDAY HOLIDAY	20	ALUMNI MEET & GRADUATION DAY	18		22	4TH SATURDAY HOLIDAY	19	Practical Exams For 1st sem 01.04.2022 To 08.04.2022 Theory Exams for 1st sem 11.04.2022 To 23.04.2022 Commencement of EVEN Semester for 6th,8thsem4.04.2022 4th sem -02.05.2022 2ndsem-6.05.2022	19		
SUN	24		21		19		23		20		20		
MON	25		22	KANAKA JAYANTHI(DH)	20		24	**THIRD INTERNAL ASSESSMENT 5th & 7th Semesters**	21		21		
TUE	26		23		21		25		22		22		
WED	27		24		22		26		23		23		
THU	28		25		23		27		24		24		
FRI	29		26		24		28	**Lab internals for 5th & 7th Sem**	25		25		
SAT	30		27	4TH SATURDAY HOLIDAY	25	4TH SATURDAY HOLIDAY	29		26		26		
SUN	31		28	**FIRST INTERNAL ASSESSMENT 3rd Semester**	26		30		27		27		
MON			29		27		31	**Last Working day of 5th & 7th Sem**	28		28		

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

ACADEMIC CALENDAR FOR 1ST SEMESTER OF UG PROGRAMS FOR THE YEAR 2021-22.

Date 20/12/2021

Events	I semester B.E./B. Tech
Commencement of ODD Semester	13-12-2021
First Test -CIE	24th, 25th and 27th January 2022
Second Test -CIE	21st, 22nd and 23rd February 2022
Third Test -CIE	21st, 22nd and 23rd March 2022
Lab Internals	25th March to 30th March 2022
Last Working day of ODD Semester	30-03-2022
Practical Examination	01-04-2022 to 08-04-2022
Theory Examinations	11-04-2022 to 23-04-2022
Internship	25-04-2022 to 14-05-2022
Commencement of EVEN Semester	16-05-2022

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

ACADEMIC YEAR : 21-22 (odd sem)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE PREFERNCE

Name of the Faculty: VINUTHA HM.

Designation: Asst. Prof

Year / Semester:

Sl.No	Course Code and Name	Year/Semester
1.	18CS53 - DBMS	3rd / 5th
2.	18CSL56 - DBMS Lab	3rd / 5th
3.	17CS71 - ML	4th / 7th
4	18CS33 - DS	2nd / 3rd

Vinutha
Signature of faculty

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

ACADEMIC YEAR : 21-22 (odd sem)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE PREFERNCE

Name of the Faculty: Ambika PR

Designation: Asst. Prof

Year / Semester:

Sl.No	Course Code and Name	Year/Semester
1.	18CS71 - AI ML	4th / 7th
2.	18CCL76 - AI ML Lab	4th / 7th
3.	18CS65 - ADP	3rd / 5th

Signature of faculty

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

ACADEMIC YEAR: 2021 - 2022(Odd)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE ALLOCATION

Sl.No	Name of the Faculty	Course Code and Name	Year/ Semester	Signature
1	Dr. Nanda Kumar A N	18CS51 - Management & Entrepreneurship 18CSP77 – Project work 17CS754 – Storage Area Network	3rd / 5th 4th / 7th	
2	Dr. Sowmya Naik P.T	18CS734 – User Interface Design	4th / 7th	
3	Mr. Nandish A.C	18CS5 – Software Engineering	2nd/ 3rd	
4	Mr. Vivekavardhana Reddy	18CS32 – Data structures and Applications 18CSL38 – Data structures Lab	2nd / 3rd 2nd / 3rd	
5	Mr. Girish G. A	18CS51 - Management & Entrepreneurship 18CSL38 – Data structures Lab 17CS72 – Advanced Computer Architecture	3rd / 5th 2nd / 3rd 4th / 7th	
6	Mr. Surendranatha Gowda	18CS33 – Analog and Digital Electronics 18CSL37 – ADE LAB	2nd / 3rd	
7	Mr. Vinod Kumar S	18CS72 – Big Data Analytics 18CSL58 – DBMS LAB with Mini Project	4th / 7th 3rd / 5th	
8	Mrs. Laxmi M.C	18CS54 – Automata Theory and Computability 18CSL76 – AIML LAB	3rd / 5th	
9	Mr. B. Ramesh	18CV752 – Numerical Methods and Application 17CS742 – Cloud Computing and its applications	4th / 7th	

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

10	Mrs. Deepika R	18CS51 - Management & Entrepreneurship	3rd / 5th	
11	Mrs. Punitha P	18CS53 – Database Management Systems	3rd / 5th	
12	Mrs. Shashikala H. C	17CS71 – Web Application and Its Applications	4th / 7th	
13	Mrs. Sowmya L. D	—	—	—
14	Mrs. Nagashree R. A	18CSL57 – Computer Network LAB	3rd / 5th	
15	Mrs. Manjula S			
16	Mr. GangappaDemannavar	18CSL76 – AIML LAB		
17	Mr. Doreswamy G S	18CSL38 – Data structures Lab 17CSL76 – ML Lab	2nd / 3rd 4th / 7th	
18	Mrs. Tejaswini B N	18CS34 – Computer Organization 18CSL57 – Computer Network LAB	2nd / 3rd	
19	Mrs. Nandini S B	18CS56 – Unix Programming 18CSL57 – Computer Network LAB	3rd / 5th	
20	Mrs. Sangeetha Rao S	18CS35 – Software Engineering 18CSL37 – ADE LAB 17CSL77 – Web Technology Lab with Mini Project	2nd / 3rd 4th / 7th	
21	Mr. Rakesh M	18CS32 - DS	2nd / 3rd	
22	Mrs. Swethashree R. N	17CS73 – Machine Learning 17CSL76 – ML LAB	4th / 7th	
23	Mrs. Vinutha H M	18CS53 – Database Management Systems 18CSL58 – DBMS LAB with Mini Project	3rd / 5th	

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

24	Mrs. Ambika P R	18CS71 – Artificial Intelligence & Machine Learning 18CSL76 – AIML Lab	4th / 7th	
25	Mrs. Archana Bhat	18CS55 – Application Development Using Python 18CSL58 – DBMS LAB with Mini Project	3rd / 5th	

HOD

HOD
Dept of Computer Science & Engineering
CITY ENGINEERING COLLEGE
Doddakallasandra, Off Kanakapura Road
Bangalore 560061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

Department Of CSE

Oct 2021– Jan 2022

Time Table for V Sem A Section

Room: C-203

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	ADP	ATC	Short Break	CNS	CNS	Lunch Break	ME	DBMS(T)	
TUE	DBMS	ATC		ME	UNIX		A1 – CN LAB/ A2 – DBMS LAB		
WED	A2 – CN LAB/ A3 – DBMS LAB				DBMS (T)		CNS	CNS(T)	ES
THU	UNIX	DBMS		ME	ADP		A3 – CN LAB/ A1 – DBMS LAB		
FRI	ADP	UNIX		DBMS	ATC		CNS(T)	ME(T)	
SAT	DBMS Mini Project			CNS LAB (T)					

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18CS51	Management, Entrepreneurship for IT Industry	ME	Dr. Nandakumar A N
2	18CS52	Computer Networks and Security	CNS	Dr. S Vagdevi
3	18CS53	Database Management System	DBMS	Ms. Vinutha H M
4	18CS54	Automata Theory and Computability	ATC	Mrs. Laxmi M C
5	18CS55	Application Development Using Python	ADP	Mrs. Archana Bhat
6	18CS56	Unix Programming	UNIX	Mrs. Nandini S B
7	18CSL57	Computer Network Laboratory	CN LAB	Mrs. Nandini S B/ Mrs. Tejaswini
8	18CSL58	DBMS Laboratory	DBMS LAB	Ms. Vinutha/ Mrs. Archana Bhat/ Mr. Vinod Kumar
9	18CIV59	Environmental Studies	ES	Mrs. Sunitha

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PRINCIPAL

CITY ENGINEERING COLLEGE

Department Of CSE

Oct 2021– Jan 2022

Time Table for V Sem B Section

Room: C-204

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	ME	DBMS	Short Break	UNIX	ATC	Lunch Break	B1 – CN LAB/ B2 – DBMS LAB		
TUE	ADP	UNIX		CNS	CNS		DBMS(T)	ES	
WED	DBMS	ADP		ME	CNS(T)		B2 – CN LAB/ B3 – DBMS LAB		
THU	ATC	ME(T)		UNIX	DBMS(T)		CNS	CNS(T)	
FRI	DBMS	ATC		ADP	ME(T)		B3 – CN LAB/ B1 – DBMS LAB		
SAT	CNS LAB (T)			DBMS Mini Project					

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18CS51	Management, Entrepreneurship for IT Industry	ME	Mr. Girish G A
2	18CS52	Computer Networks and Security	CNS	Dr. S Vagdevi
3	18CS53	Database Management System	DBMS	Ms. Vinutha H M
4	18CS54	Automata Theory and Computability	ATC	Mrs. Laxmi M C
5	18CS55	Application Development Using Python	ADP	Mrs. Archana Bhat
6	18CS56	Unix Programming	UNIX	Mrs. Nandini S B
7	18CSL57	Computer Network Laboratory	CN LAB	Mrs. Nandini S B/ Mrs. Tejaswini
8	18CSL58	DBMS Laboratory	DBMS LAB	Ms. Vinutha/ Mrs. Archana Bhat/ Mr. Vinod Kumar
9	18CIV59	Environmental Studies	ES	Mrs. Sunitha

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

HOD

PRINCIPAL

CITY ENGINEERING COLLEGE

Department Of CSE

Oct 2021– Jan 2022

Time Table for VII Sem A Section

Room: C-303

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	BDA	OE	Short Break	AI/ML	NM	Lunch Break	Project Work		
TUE	AI/ML	NM		UID	BDA		AI/ ML LAB (A1 Batch)		
WED	NM	BDA		UID	OE		Project Work		
THU	AI/ ML LAB (A2 Batch)				AI/ML		Internship / Seminar		
FRI	OE	AI/ML		BDA	UID		Placement Activities		
SAT	Placement Activities			Placement Activities					

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18CS71	Artificial Intelligence and Machine Learning	AI&ML	Mrs. Ambika P R
2	18CS72	Big Data Analytics	BDA	Mr. Vinod Kumar
3	18CS734	User Interface Design	UID	Dr. Sowmya Naik
4	18CS742	Network Management	NM	Dr. N. Rajasekhar Reddy
5		Open Elective	OE	Mr. Ramesh B
6	18CSL76	Artificial Intelligence and Machine Learning Laboratory	AI&ML LAB	Mrs. Ambika P R/ Mrs. Laxmi M C
7	18CSP77	Project Work Phase I	Project	Mr. Vivekavardhana Reddy
8	-	Internship	INT	Dr. Nandakumar A N

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PRINCIPAL

CITY ENGINEERING COLLEGE

Department Of CSE

Oct 2021– Jan 2022

Time Table for VII Sem B Section

Room: C-304

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	AI/ML	UID	Short Break	BDA	OE	Lunch Break	AI/ ML LAB (B1 Batch)		
TUE	BDA	OE		AI/ML	NM		Project Work		
WED	UID	AI/ML		NM	BDA		Internship/ Seminar		
THU	NM	BDA		OE	UID		Project Work		
FRI	AI/ ML LAB (B2 Batch)				AI/ML		Placement Activities		
SAT	Placement Activities			Placement Activities					

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18CS71	Artificial Intelligence and Machine Learning	AI&ML	Mrs. Ambika P R
2	18CS72	Big Data Analytics	BDA	Mr. Vinod Kumar
3	18CS734	User Interface Design	UID	Dr. Sowmya Naik
4	18CS742	Network Management	NM	Dr. N. Rajasekhar Reddy
5	18CV752	Open Elective - Numerical Methods and Applications	OE	Mr. Ramesh B
6	18CSL76	Artificial Intelligence and Machine Learning Laboratory	AI&ML LAB	Mrs. Ambika P R/ Mrs. Laxmi M C
7	18CSP77	Project Work Phase I	Project	Mr. Vivekavardhana Reddy
8	-	Internship	INT	Dr. Nandakumar A N

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

HOD

PRINCIPAL

CITY ENGINEERING COLLEGE

Department Of CSE

Oct 2021– Jan 2022

Time Table for VII Sem B Section (17 Scheme)

Room: C-302

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	WEB	ML	Short Break	ACA	SAN	Lunch Break	Web LAB		
TUE	ML	ACA		WEB	CC		ML LAB		
WED	ACA	CC		SAN	WEB		Project Work/ Seminar		
THU	CC	WEB		ML	ACA		Project Work/ Seminar		
FRI	WEB Mini Project			SAN	ML		Placement Activities		
SAT	Placement Activities			Placement Activities					

Sl . No	Course Code	Course Name	Course	Faculty Name
1	17CS71	Web Application and Its Applications	WEB	Mrs. Shashikala H C
2	17CS72	Advanced Computer Architecture	ACA	Mr. Girish G A
3	17CS73	Machine Learning	ML	Mrs. Swethashree R N
4	17CS742	Cloud Computing and Its Applications	CC	Mr. Ramesh B
5	17CS754	Storage Area Network	SAN	Dr. Nandakumar A N
6	17CSL76	Machine Learning Laboratory	ML LAB	Mrs. Swethashree R N
7	17CSL77	Web Technology Lab with Mini Project	Web LAB	Mrs. Sangeetha Rao S
8	17CSP78	Project Work Phase - I	Project	Mr. Vivekavardhana Reddy

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

HOD

PRINCIPAL

CITY ENGINEERING COLLEGE

Department Of CSE

Oct 2021– Jan 2022

Time Table for III Sem A Section

Room: C-201

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	MAT	ADE	Short Break	SE	DS	Lunch Break	Placement &Training / Core club activities		
TUE	ADE	CO		DS	SE		A1- DS LAB/ A2-ADE LAB		
WED	DS	MAT		CO	DMS		ADE(T)	DS LAB (T)	
THU	MAT	DS(T)		DMS	ADE		A2- DS LAB/ A1-ADE LAB		
FRI	SE	DMS		MAT	CO		Placement &Training / Core club activities		
SAT	KAN	KAN		ADE(T)	DS(T)				

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18MAT31	Transform Calculus, Fourier Series and numerical Techniques	MAT	Mrs. Gayathri A
2	18CS32	Data Structures and Applications	DS	Mr. Vivekavardhana Reddy
3	18CS33	Analog and Digital Electronics	ADE	Mr. Surendranath Gowda
4	18CS34	Computer Organization	CO	Mrs. Tejaswini B N
5	18CS35	Software Engineering	SE	Mrs. Sangeetha S
6	18CS36	Discrete Mathematical Structures	DMS	Mrs. Vanitha
7	18CSL37	Analog and Digital Electronics Laboratory	ADE LAB	Mr. Surendranath Gowda/ Mrs. Sangeetha S
8	18CSL38	Data Structures Laboratory	DS LAB	Mr. Vivekavardhan Reddy/ Mr. Girish G A
9	18KVK39/18KAK39	Vyavaharika Kannada/ Aadalitha Kannada	KAN	Mrs. Deepa

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PRINCIPAL

CITY ENGINEERING COLLEGE

Department Of CSE

Oct 2021– Jan 2022

Time Table for III Sem B Section

Room: C-202

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15– 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	CO	DS	Short Break	MAT	ADE	Lunch Break	B1- DS LAB/ B2-ADE LAB		
TUE	DS	SE		MAT	DMS		ADE(T)	DS LAB(T)	
WED	ADE	DMS		MAT (T)	DS		B2- DS LAB/ B1-ADE LAB		
THU	DMS	SE		MAT (T)	CO		Placement &Training / Core club activities		
FRI	CO	ADE		DS(T)	SE		Placement &Training / Core club activities		
SAT	ADE(T)	DS(T)		KAN	KAN				

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18MAT31	Transform Calculus, Fourier Series and numerical Techniques	MAT	Mrs. Gayathri A
2	18CS32	Data Structures and Applications	DS	Mr. Vivekavardhana Reddy
3	18CS33	Analog and Digital Electronics	ADE	Mr. Surendranath Gowda
4	18CS34	Computer Organization	CO	Mrs. Tejaswini B N
5	18CS35	Software Engineering	SE	Mrs. Sangeetha S
6	18CS36	Discrete Mathematical Structures	DMS	Mrs. Vanitha
7	18CSL37	Analog and Digital Electronics Laboratory	ADE LAB	Mr. Surendranath Gowda/ Mrs. Sangeetha S
8	18CSL38	Data Structures Laboratory	DS LAB	Mr. Vivekavardhan Reddy/ Mr. Girish G A
	18KVK39/18KAK39	Vyavaharika Kannada/ Aadalitha Kannada	KAN	Mrs. Deepa

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PRINCIPAL

CITY ENGINEERING COLLEGE

Department Of CSE

Oct 2021 – Jan 2022

Faculty Name: Mrs. Archana Bhat **Sem: V- A, B** **Subject: ADP**

DAY	9:00 – 10:00	10:00 – 11:00		11:15 - 12:15	12:15 – 1:15		2:00 – 3:00 PM	3:00 – 4:00	4:00 – 5:00
MON	A		Short Break			Lunch Break	DBMS LAB (B2)		
TUE	B						DBMS LAB (A2)		
WED	DBMS LAB (A3)			DBMS LAB (A3)	B(T)				
THU	B				A		DBMS LAB (A1)		
FRI	A			B			A(T)		
SAT									

Lecture: 6 x 2 = 12

Tutorial: 2 x 1 = 2

Practical: 4 x 3 = 12

Department Work: 4

Total Workload: 30

HOD

Principal

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

APPLICATION DEVELOPMENT USING PYTHON
[(Effective from the academic year 2018 -2019)
SEMESTER – V

Course Code	**18CS55**	**IA Marks**	40
Number of Lecture Hours/Week	03	**Exam Marks**	60
Total Number of Lecture Hours	40	**Exam Hours**	03

CREDITS – 03

Course Learning Objectives: This course (18CS55) will enable students to

- Learn the syntax and semantics of Python programming language.
- Illustrate the process of structuring the data using lists, tuples and dictionaries.
- Demonstrate the use of built-in functions to navigate the file system.
- Implement the Object Oriented Programming concepts in Python.
- Appraise the need for working with various documents like Excel, PDF, Word and Others.

Module – 1	**Teaching Hours**
Python Basics, Entering Expressions into the Interactive Shell, The Integer, Floating-Point, and String Data Types, String Concatenation and Replication, Storing Values in Variables, Your First Program, Dissecting Your Program.**Flow control,** Boolean Values, Comparison Operators, Boolean Operators,Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution, Flow Control Statements, Importing Modules.Ending a Program Early with sys.exit(), **Functions,** def Statements with Parameters, Return Values and return Statements,The None Value, Keyword Arguments and print(), Local and Global Scope, The global Statement, Exception Handling, A Short Program: Guess the Number **Textbook 1: Chapters 1 – 3** **RBT: L1, L2**	08
Module – 2	
Lists, The List Data Type, Working with Lists, Augmented Assignment Operators, Methods, Example Program: Magic 8 Ball with a List, List-like Types: Strings and Tuples.References. **Dictionaries and Structuring Data,** The Dictionary Data Type, Pretty Printing, Using Data Structures to Model Real-World Things. **Manipulating Strings,** Working with Strings, Useful String Methods, Project: Password Locker, Project: Adding Bullets to Wiki Markup **Textbook 1: Chapters 4 – 6** **RBT: L1, L2, L3**	08
Module – 3	
Pattern Matching with Regular Expressions, Finding Patterns of Text Without Regular Expressions, Finding Patterns of Text with Regular Expressions,More Pattern Matching with Regular Expressions, Greedy and Nongreedy Matching, The findall() Method, Character Classes, Making Your Own Character Classes, The Caret and Dollar Sign Characters, The Wildcard Character, Review of Regex Symbols, Case-Insensitive Matching, Substituting Strings with the sub() Method, Managing Complex Regexes, Combining re .IGNORECASE, re .DOTALL, and re .VERBOSE, Project: Phone Number and Email Address Extractor. **Reading and Writing Files,** Files and File Paths, The os.path Module, The File Reading/Writing Process, Saving Variables with the shelve Module,Saving Variables with the pprint.pformat() Function, Project: Generating Random Quiz Files, Project: Multiclipboard, **Organizing Files,** The shutil Module, Walking a Directory Tree, Compressing Files with the zipfile Module, Project: Renaming Files with American-Style Dates to European-Style Dates,Project: Backing Up a Folder into a ZIP File, **Debugging,** Raising Exceptions, Getting the Traceback as a String, Assertions, Logging, IDLE's Debugger. **Textbook 1: Chapters 7 – 10**	08

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

RBT: L1, L2, L3	
Module – 4	
Classes and objects, Programmer-defined types, Attributes, Rectangles, Instances as return values, Objects are mutable, Copying, **Classes and functions,** Time, Pure functions, Modifiers, Prototyping versus planning, **Classes and methods,** Object-oriented features, Printing objects, Another example, A more complicated example,The init method, The __str__ method, Operator overloading, Type-based dispatch, Polymorphism, Interface and implementation.**Inheritance,** Card objects, Class attributes, Comparing cards, Decks, Printing the deck, Add, remove, shuffle and sort, Inheritance, Class diagrams, Data encapsulation **Textbook 2: Chapters 15 – 18** **RBT: L1, L2, L3**	08
Module – 5	
Web Scraping, Project: MAPIT.PY with the webbrowser Module, Downloading Files from the Web with the requests Module, Saving Downloaded Files to the Hard Drive, HTML, Parsing HTML with the BeautifulSoup Module, Project: "I'm Feeling Lucky" Google Search,Project: Downloading All XKCD Comics, Controlling the Browser with the selenium Module, **Working with Excel Spreadsheets,** Excel Documents, Installing the openpyxl Module, Reading Excel Documents, Project: Reading Data from a Spreadsheet, Writing Excel Documents, Project: Updating a Spreadsheet, Setting the Font Style of Cells, Font Objects, Formulas, Adjusting Rows and Columns, Charts, **Working with PDF and Word Documents,** PDF Documents, Project: Combining Select Pages from Many PDFs, Word Documents, **Working with CSV files and JSON data,** The csv Module, Project: Removing the Header from CSV Files, JSON and APIs, The json Module, Project: Fetching Current Weather Data **Textbook 1: Chapters 11 – 14** **RBT: L1, L2, L3**	08
Course Outcomes: After studying this course, students will be able to	
• Demonstrate proficiency in handling of loops and creation of functions. • Identify the methods to create and manipulate lists, tuples and dictionaries. • Discover the commonly used operations involving regular expressions and file system. • Interpret the concepts of Object-Oriented Programming as used in Python. • Determine the need for scraping websites and working with CSV, JSON and other file formats.	
Question paper pattern:	
• The question paper will have ten questions. • Each full Question consisting of 20 marks • There will be 2 full questions (with a maximum of four sub questions) from each module. • Each full question will have sub questions covering all the topics under a module. • The students will have to answer 5 full questions, selecting one full question from each module.	
Text Books:	
1. Al Sweigart,**"Automate the Boring Stuff with Python",** 1st Edition, No Starch Press, 2015. (Available under CC-BY-NC-SA license at https://automatetheboringstuff.com/) (Chapters 1 to 18) 2. Allen B. Downey, **"Think Python: How to Think Like a Computer Scientist",** 2nd Edition, Green Tea Press, 2015. (Available under CC-BY-NC license at http://greenteapress.com/thinkpython2/thinkpython2.pdf) (Chapters 13, 15, 16, 17, 18) (Download pdf/html files from the above links)	
Reference Books:	
1. Gowrishankar S, Veena A, **"Introduction to Python Programming",** 1st Edition, CRC Press/Taylor & Francis, 2018, ISBN-13: 978-0815394372	

2. Jake VanderPlas, **"Python Data Science Handbook: Essential Tools for Working with Data"**, 1st Edition, O'Reilly Media, 2016. ISBN-13: 978-1491912058
3. Charles Dierbach, **"Introduction to Computer Science Using Python"**, 1st Edition, Wiley India Pvt Ltd, 2015. ISBN-13: 978-8126556014
4. Wesley J Chun, **"Core Python Applications Programming"**, 3rd Edition, Pearson Education India, 2015. ISBN-13: 978-9332555365

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

"ACCREDITED BY NAAC"

DEPARTMENT OF CSE

LESSON PLAN FOR ODD SEMESTER FOR ACADEMIC YEAR 2021 - 2022

Course Title: Application Development Using Pyhton	Course Code: 18CS55
Total contact hours: L: T:P:S: 3: 0: 0: 0	End Term Marks :60
Internal Marks: 40	
Semester: V – 'A'	Academic year: 2021-22
Lesson plan Author: Mrs. Archana Bhat	Date : 30/09/2021

Course objectives: This course will enable students to

- Learn the syntax and semantics of Python programming language.
- Illustrate the process of structuring the data using lists, tuples and dictionaries.
- Demonstrate the use of built-in functions to navigate the file system.
- Implement the Object Oriented Programming concepts in Python.
- Appraise the need for working with various documents like Excel, PDF, Word and Others.

Course Outcomes: The students shall able to:

- Demonstrate proficiency in handling of loops and creation of functions.
- Identify the methods to create and manipulate lists, tuples and dictionaries.
- Discover the commonly used operations involving regular expressions and file system.
- Interpret the concepts of Object-Oriented Programming as used in Python.
- Determine the need for scraping websites and working with CSV, JSON and other file formats

Module 1

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
1	Introduction to Python Programming	L1, L2	CO1
2	**Python Basics:** Entering Expressions into the Interactive Shell, The Integer, Floating-Point, and String Data Types	L1, L2	CO1
	String Concatenation and Replication, Storing Values in Variables	L1, L2, L3	CO1
	First Program, Dissecting Your Program	L2, L3	CO1
3	**Flow control:** Boolean Values, Comparison Operators, Boolean Operators,Mixing Boolean and Comparison Operators, Elements of Flow Control	L1, L2, L3	CO1
	Program Execution, Flow Control Statements, Importing Modules, Ending a Program Early with sys.exit()	L2, L3	CO1
4	**Functions:** def Statements with Parameters, Return Values and return Statements, The None Value	L2, L3	CO1
	Keyword Arguments and print(), Local and Global Scope, The global Statement,	L1, L2	CO1
	Exception Handling, Program: Guess the Number	L2, L3	CO1

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Module 2

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
5	**Lists:**The List Data Type, Working with Lists	L1, L2	CO2
	Augmented Assignment Operators, Methods	L1, L2	CO2
	Example Program: Magic 8 Ball with a List	L2, L3	CO2
6	List-like Types: Strings and Tuples,References	L2, L3	CO2
7	**Dictionaries and Structuring Data:**The Dictionary Data Type, Pretty Printing	L1, L2	CO2
	Using Data Structures to Model Real-World Things	L2, L3	CO2
8	**Manipulating Strings:** Working with Strings, Useful String Methods	L1, L2, L3	CO2
	Project: Password Locker, Project: Adding Bullets to Wiki Markup	L2, L3	CO2

Module 3

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
8	**Pattern Matching with Regular Expressions:** Finding Patterns of Text Without Regular Expressions, Finding Patterns of Text with Regular Expressions	L2, L3	CO3
9	More Pattern Matching with Regular Expressions, Greedy and Nongreedy Matching, The findall() Method	L2, L3	CO3
	Character Classes, Making Your Own Character Classes, The Caret and Dollar Sign Characters, The Wildcard Character, Review of Regex Symbols	L1, L2, L3	CO3
10	Case-Insensitive Matching, Substituting Strings with the sub() Method, Managing Complex Regexes, Combining re .IGNORECASE, re .DOTALL, and re .VERBOSE, Project: Phone Number and Email Address Extractor	L1, L2, L3	CO3
	Reading and Writing Files: Files and File Paths, The os.path Module, ,	L1, L2	CO3
	The File Reading/Writing Process, Saving Variables with the shelve Module	L2, L3	CO3
11	Saving Variables with the pprint.pformat() Function, Project: Generating Random Quiz Files, Project: Multiclipboard,	L2, L3	CO3
	Organizing Files: The shutil Module, Walking a Directory Tree	L2, L3	CO3
12	Compressing Files with the zipfile Module, Project: Renaming Files with American-Style Dates to European-Style Dates,Project: Backing Up a Folder into a ZIP File	L2, L3	CO3
	Debugging: Raising Exceptions, Getting the Traceback as a String,	L2, L3	CO3
	Assertions, Logging, IDLE's Debugger.	L2, L3	CO3

Module 4

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
13	**Classes and objects:** Programmer-defined types, Attributes, Rectangles, Instances as return values, Objects are mutable, Copying	L2, L3	CO4
	Classes and functions: Time, Pure functions, Modifiers, Prototyping versus planning	L2, L3	CO4
	Classes and methods: Object-oriented features, Printing objects, Another example, A more complicated example,The init method, The __str__ method	L2, L3	CO4
14	Operator overloading, Type-based dispatch, Polymorphism	L2, L3	CO4
	Interface and implementation	L2, L3	CO4
	Inheritance: Card objects, Class attributes, Comparing cards, Decks, Printing the deck	L2, L3	CO4
15	Add, remove, shuffle and sort, Inheritance, Class diagrams, Data encapsulation	L2, L3	CO4

Module 5

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
15	**Web Scraping:** Project: MAPIT.PY with the webbrowser Module, Downloading Files from the Web with the requests Module, Saving Downloaded Files to the Hard Drive	L2, L3	CO5
	HTML, Parsing HTML with the BeautifulSoup Module, Project: "I'm Feeling Lucky" Google Search	L2, L3	CO5
16	Project: Downloading All XKCD Comics, Controlling the Browser with the selenium Module	L2, L3	CO5
	Working with Excel Spreadsheets: Excel Documents, Installing the openpyxl Module, Reading Excel Documents	L2, L3	CO5
17	Project: Reading Data from a Spreadsheet, Writing Excel Documents	L2, L3	CO5
	Project: Updating a Spreadsheet, Setting the Font Style of Cells, Font Objects, Formulas, Adjusting Rows and Columns, Charts	L2, L3	CO5
	Working with PDF and Word Documents: PDF Documents, Project: Combining Select Pages from Many PDFs, Word Documents	L2, L3	CO5
18	**Working with CSV files and JSON data:** The csv Module, Project: Removing the Header from CSV Files	L2, L3	CO5
	JSON and APIs, The json Module, Project: Fetching Current Weather Data	L2, L3	CO5

RBT Level

L1-Remembering L2-Understanding L3-Applying L4-Analysing L5-Evaluating L6-Creating

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Text Books:

1. Al Sweigart,"Automate the Boring Stuff with Python",1 stEdition, No Starch Press, 2015. (Chapters 1 to 18)
2. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd Edition, Green Tea Press, 2015. (Chapters 13, 15, 16, 17, 18) (Download pdf/html files from the above links)

Reference Books:

1. Gowrishankar S, Veena A, "Introduction to Python Programming", 1st Edition, CRC Press/Taylor & Francis, 2018. ISBN-13: 978-0815394372
2. Jake VanderPlas, "Python Data Science Handbook: Essential Tools for Working with Data", 1 st Edition, O'Reilly Media, 2016. ISBN-13: 978-1491912058
3. Charles Dierbach, "Introduction to Computer Science Using Python", 1 st Edition, Wiley India Pvt Ltd, 2015. ISBN-13: 978-8126556014
4. Wesley J Chun, "Core Python Applications Programming", 3rd Edition, Pearson Education India, 2015. ISBN-13: 978-9332555365

e- Learning Resources:

- https://automatetheboringstuff.com/
- http://greenteapress.com/thinkpython2/thinkpython2.pdf

Signature of Faculty

Signature of HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN | 1 | C | E | | | | | | | |

COURSE CODE: 18CS55

CITY

ENGINEERING COLLEGE

Kanakapura Road, Doddakallasandra, Bengaluru - 560062

FIRST INTERNAL TEST

Programme : Computer Science & Engineering
Course Name: Application Development Using Python — **Date: 10/11/2021**
Semester : V — **Time: 9:30-11:00AM**
Duration : 1 ½Hrs — **MAX MARKS: 50**

Note: Answer any FIVE questions choosing at least ONE from each Part.

			CO'S	BT'S
	Part – A			
1.	a. Explain the math operators in Python from highest to lowest Precedence with an example for each. Write the steps how Python is evaluating the expression (5 - 1) * ((7 + 1) / (3 - 1)) and reduces it to a single value. b. Which of the following are operators, and which are values? Justify your answer. * 'hello' -88.8 / + 5	7 3	CO1	BT2,3
	Or			
2.	a. List the salient features of python programming language. b. Explain Local and Global Scope in Python programs. What are local and global variables? How can you force a variable in a function to refer to the global variable?	4 6	CO1	BT1,2
	Part – B			
3.	What are the different flow control statements supports in python? Explain any 3 with a suitable example program and flow chart.	10	CO1	BT1,2
	Or			
4.	Explain elif, for, while, break and continue statements in Python with examples for each.	10	CO1	BT1,2
	Part-C			
5.	a. What is the difference between range(10), range(0, 10), and range(0, 10, 1) in a for loop? b. Write a function named collatz() that has one parameter named number. If number is even, then collatz() should print number // 2 and return this value. If number is odd, then collatz() should print and return 3 * number + 1. Then write a program that lets the user type in an integer and that keeps calling collatz() on that number until the function returns the value 1.	3 7	CO1	BT2,3
	Or			

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

6.	a. What is Exception Handling? How exceptions are handled in Python? Write a Python program with exception handling code to solve divide-by-zero error situation. b. What is the difference between the equal to operator and the assignment operator? c. Why does this expression cause an error? How can you fix it? 'I have eaten ' + 99 + ' burritos.'	6 2 2	CO1	BT2,3
	Part-D			
7.	a. How can you prevent a program from crashing when it gets an error? Explain with example. b. Write a function that converts a string to a float and returns the result. Use exception handling to catch the exception that could occur.	5 5	CO1	BT2,3
	Or			
.	What are Comparison and Boolean operators? List all the Comparison and Boolean operators in Python and explain the use of these operators with suitable examples.	10	CO1	BT1,2
	Part-E			
9.	What is a function? How to define a function in python? Define a Python function with suitable parameters to generate prime numbers between two integer values. Write a Python program which accepts two integer values m and n (note: m>0, n>0 and m < n) as inputs and pass these values to the function. Suitable error messages should be displayed if the conditions for input values are not followed.	10	CO1	BT2,3
	Or			
10	a. Why are functions advantageous to have in your programs? b. Write a program with two functions. The first function should take an integer as a parameter and return the result of the integer divided by 2. The second function should take an integer as a parameter and return the result of the integer multiplied by 4. Call the first function, save the result as a variable, and pass it as a parameter to the second function. Draw the callstack.	4 6	CO1	BT2,3

.ooms Taxonomy Levels (BTL): BT1-Remembering **BT2**- Understanding **BT3**-Applying **BT4**-Analysing

Course Outcomes (CO's):

CC1: Demonstrate proficiency in handling of loops and creation of functions.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ADP (18CS55) - Question Bank

Module 1

Archana Bhat, Dept of CSE

1. Demonstrate with example print(), input() and string replication.
2. Explain elif, for, while, break and continue statements in Python with examples for each.
3. Explain the math operators in Python from highest to lowest Precedence with an example for each. Write the steps how Python is evaluating the expression (5 - 1) * ((7 + 1) / (3 - 1)) and reduces it to a single value.
4. What are the different flow control statements supports in python. Explain any 3 with a suitable example program and flow chart.
5. How can we pass the parameters in user defined functions? Explain with suitable example.
6. List the salient features of python programming language.
7. What is local and global scope of variable in python. Explain the different scenarios with an example snippet.
8. Explain Local and Global Scope in Python programs. What are local and global variables? How can you force a variable in a function to refer to the global variable?
9. What are Comparison and Boolean operators? List all the Comparison and Boolean operators in Python and explain the use of these operators with suitable examples.
10. What is Exception Handling? How exceptions are handled in Python? Write a Python program with exception handling code to solve divide-by-zero error situation.
11. Write a program to check whether a given number is odd or even.
12. Implement a code which prompt the user for Celsius temperature and convert the temperature to Fahrenheit, and print the converted temperature by handling the exception.
13. Write a python program to calculate the area of circle, rectangular and triangle. Print the results.
14. Define a Python function with suitable parameters to generate prime numbers between two integer values. Write a Python program which accepts two integer values m and n (note: m>0, n>0 and m < n) as inputs and pass these values to the function. Suitable error messages should be displayed if the conditions for input values are not followed.
15. What is a function? How to define a function in python? Write a program using function to find out the given string is palindrome or not.

16. Define a Python function with suitable parameters to generate first N Fibonacci numbers. The first two Fibonacci numbers are 0 and 1 and the Fibonacci sequence is defined as a function F as Fn = Fn-1 + Fn-2. Write a Python program which accepts a value for N (where N >0) as input and pass this value to the function. Display suitable error message if the condition for input value is not followed.
17. Write code that prints Hello if 1 is stored in spam, prints Howdy if 2 is stored in spam, and prints Greetings! if anything else is stored in spam.
18. Write a short program that prints the numbers 1 to 10 using a for loop. Then write an equivalent program that prints the numbers 1 to 10 using a while loop.
19. Write a function named collatz() that has one parameter named number. If number is even, then collatz() should print number // 2 and return this value. If number is odd, then collatz() should print and return 3 * number + 1. Then write a program that lets the user type in an integer and that keeps calling collatz() on that number until the function returns the value 1. The output of this program could look something like this:

    Enter number:

    3

    10

    5

    16

    8

    4

    2

    1
20. Write a function named right_justify that takes a string named s as a parameter and prints the string with enough leading spaces so that the last letter of the string is in column 70 of the display.

    >>> right_justify('monty')

                                                                monty

Hint: Use string concatenation and repetition. Also, Python provides a built-in function called len that returns the length of a string, so the value of len('monty') is 5.

21. A function object is a value you can assign to a variable or pass as an argument. For example, do_twice is a function that takes a function object as an argument and calls it twice:

```
def do_twice(f):
    f()
    f()
```

Here's an example that uses do_twice to call a function named print_spam twice.

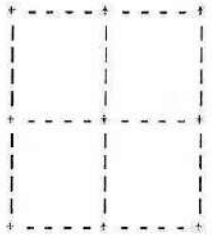
```
def print_spam():
    print('spam')
do_twice(print_spam)
```

a) Type this example into a script and test it.

b) Modify do_twice so that it takes two arguments, a function object and a value, and calls the function twice, passing the value as an argument.

c) Define a new function called do_four that takes a function object and a value and calls the function four times, passing the value as a parameter. There should be only two statements in the body of this function, not four.

22. Write a function that draws a grid like the following:



Hint: to print more than one value on a line, you can print a comma-separated sequence of values:

```
print('+', '-')
```

ADP (18CS55) – Question Bank
Module 2

Archana Bhat, Dept of CSE

1. What is Dictionary in Python? How is it different from List data type? Explain how a for loop can be used to traverse the keys of the Dictionary with an example.
2. What is list? Explain the concept of slicing and indexing with proper examples
3. Explain the methods of List data type in Python for the following operations with suitable code snippets for each. (i) Adding values to a list ii) Removing values from a list (iii) Finding a value in a list iv) Sorting the values in a list.
4. Write a Python program that accepts a sentence and find the number of words, digits, uppercase letters and lowercase letters.
5. What is the difference between copy.copy( ) and copy.deepcopy( ) functions applicable to a List or Dictionary in Python? Give suitable examples for each.
6. Discuss the following Dictionary methods in Python with examples. (i) get() (ii) items() (iii) keys() (iv) values().
7. Explain the various string methods for the following operations with examples. (i) Removing whitespace characters from the beginning, end or both sides of a string. (ii) To right-justify, left-justify, and center a string.
8. What are the different methods supports in python List. Illustrate all the methods with an example.
9. What is dictionary? Illustrate with an example python program the usage of nested dictionary.
10. List out all the useful string methods which supports in python. Explain with an example for each method.
11. What are the different steps in project Adding Bullets to Wiki Markup?
12. What is list? Explain append(), insert() and remove() methods with examples.
13. How is tuple different from a list and which function is used to convert list to tuple.
14. Create a function to print out a blank tic tac toe board.
15. With example code explain join() and split() string methods.
16. Develop a program to accept a sentence from the user and display the longest word of that sentence along with its length.

ADP (18CS55) – Question Bank
Module 3

Archana Bhat, Dept of CSE

1. What are regular expressions? What are the different steps to be followed to use a regular expression in python?
2. List out what are the different character classes and its representation also regular expression symbol and its meaning.
3. Write a python program to create phone number and email address by using regular expression.
4. Describe the following with suitable Python code snippet.
   (i) Greedy and Non Greedy Pattern Matching
   (ii) findall() method of Regex object.
5. Write a Python Program to find an American phone number (example: 415-555-4242) in a given string using Regular Expressions.
6. What are regular expressions? Describe question mark, star, plus and dot Regex symbols with suitable python code snippet.
7. Write a program that reads a string with five characters which starts with 'a' and ends with 'z'. Print search successful if pattern matches string.
8. Describe the difference between Python os and os.path modules. Also, discuss the following methods of os module a) chdir() b) rmdir() c) walk() d) listdir() e) getcwd().
9. Demonstrate the copy, move, rename and delete functions of shutil module with Python code snippet.
10. Explain the file Reading/Writing process with suitable Python Program.
11. Define assertions. What does an assert statement in python consists of? Explain how assertions can be used in traffic light simulation with Python code snippet.
12. What are the key properties of a file? Explain in detail file reading/writing process wit an example of python program.
13. Explain in briefly, What are the different methods of file operations supports in python shutil module.
14. Write a python program to create a folder PYTHON and under the hierarchy 3 files file1,file2 and file3.write the content in file1 as "VTU" and in file2 as "UNIVERSITY" and file3 content should be by opening and merge of file1 and file2. Check out the necessary condition before write file3.
15. With code snippet, explain saving variables using shelve module and PPrint Pformat() functions.
16. Explain buttons in the Debug control window.
17. What is meant by compressing files? Explain reading, extracting and creating ZIP files with code snippet.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ADP (18CS55) – Question Bank
Module 4

Archana Bhat, Dept of CSE

1. What is a class? How to define class in python? How to initiate a class and how the class members are accessed?
2. Write a program to create a class called Point with two attributes x and y. Write following functions and demonstrate the working of these functions by creating suitable objects.
   a. To read attribute values
   b. To display point as an ordered pair
   c. To find distance between two points
   d. To find the midpoint of two points
   e. To find reflex of the point about x-axis i.e., it must return a new point object Example: point(5,10) -> reflex_x must return a new point (5,-10)
3. Write a program to create a class called Rectangle with the help of a corner point, width and height. Write following functions and demonstrate their working:
   a. To find and display center of rectangle
   b. To display point as an ordered pair
   c. To resize the rectangle
   d. To find area and perimeter of a rectangle
4. Differentiate copy.copy() and copy.deepcopy() with suitable examples.
5. Differentiate between class variables and instance variables with suitable examples
6. With help of programming examples explain the difference between Prototype and Planned Programming Development.
7. Differentiate pure functions and modifiers with suitable examples
8. What is a Docstring? Why are they written?
9. What do you mean by "instance as returning value"? Explain with an example.
10. Justify the statement "Objects are mutable" with suitable examples
11. List out the object oriented characteristics possessed by Python.
12. Differentiate methods and functions.
13. Briefly discuss self keyword in Python.
14. Discuss operator overloading.
15. Write a program to add two point objects by overloading + operator. Overload __str__() to display point as an ordered pair.
16. Write a program to create a class Time to represent time in HH:MM:SS format. Perform following operations: a. Overload + to add two time objects b. Overload + to add a numeric value to a time object (commutative) c. Overload __str__() to display time in appropriate format.
17. Define classes and objects in Python. Create a class called Employee and initialize it with employee id and name. Design methods to: (i) setAge_to assign age to employee. (ii) setSalary_to assign salary to the employee. (iii) Display_to display all information of the employee.
18. Explain init and __str__ method with an example Python Program.
19. Define polymorphism? Demonstrate polymorphism with function to find histogram to count the number of times each letter appears in a word and in a sentence.
20. Write a python program that uses datetime module within a class, takes a birthday as input and prints the age and the number of days, hours, minutes and second.
21. What is type based dispatch? Illustrate with python program.
22. Illustrate the concept of inheritance and class diagram with examples.

ADP (18CS55) – Question Bank
Module 5

Archana Bhat, Dept of CSE

1. What is web scraping? How to download files from web, check the error and save the downloaded files to hard drive with request module in python?
2. Explain the process of downloading files from the Web with the requests module and also saving downloaded files to the hard drive with suitable example program.
3. Explain parsing HTML with the beautifulSoup Module with code snippet for creating, finding an element and getting data.
4. Explain how to retrieve a web page element from a BeautifulSoup Object by calling the select method and passing a string of a CSS selector for the element you are looking for with an example program.
5. How to work with Excel spreadsheet in python. Explain briefly.
6. How to work with PDF document in python. Explain with extracting text, decrypting, creating copying pages, encrypting PDFs.
7. Write a program to get a list of all files with the pdf extension in the current working directory and sort them.
8. What is CSV and JSON files? Explain with an example program the usage of json module in python.
9. What are the advantages of CSV files? Explain the Reader objects and Writer objects with python code.
10. Write a note on the following by demonstrating with code snippet. (i) Opening Excel documents with openpyxl. (ii) Getting Sheets from the Workbook. (iii)Getting Cells, Rows and Columns from the Sheets.
11. Describe the getText() function used for getting full text from a .docx file with example code. What methods do Selenium's web element object have for simulating mouse clicks and keyboard keys. Explain with python code snippet.
12. Write a python program to access cell in a worksheet.

CITY ENGINEERIN COLLEGE
DEPARTMENT OF CSE

SCHEME FOR VALUATION

Internal Test I

Semester & Section: V - A & B Date: 10-11-2021

Question No:	Details of the Answer	Marks Distribution	Total Marks
	Part - A		
1A.	Math operators **, *, /, //, %, + and - with examples (5-1) * ((7+1) / (3-1)) ↓ 4 * ((7+1) / (3-1)) ↓ 4 * (8) / (3-1) ↓ 4 * (8) / (2) ↓ 4 * 4.0 16.0	4 M 3 M	7 M
1B.	*, /, + arithmetic operators 'hello', -88.8, 5 are string, float and integer values	3 M	3M
2a.	Salient features of python - free & open source - High level language - Simple & easy to learn - Portable - interpreted - Object Oriented - embedded within C & C++ - Rich set of functionalities, standard libraries	4 x1	4M

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Staff

HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
2b.	Parameters & variables that are assigned in a called function are said to exist in that function's local scope. Variables that are assigned outside all functions are called to exist in global scope — 1 M Rules for local & global variable's access — 1M Examples — 2M Use of global statement with example — 2M		6M
	Part-B.		
3.	Flow control statements — 1M if, elif, else, for, while Explanation of any 3 with example & flowchart — 2M Syntax — 1 M	— 3x3M	10M
4.	elif, for, while, break, continue statements Explanation with example	— 5x2M	10M
	Part - C		
5a.	range(10) — by default takes 0 as start and 1 as step value — 1M range(0,10) — here start and stop values are explicitly specified, step value will be taken as 1 — 1 M range(0,10,1) — all three arguments are explicitly specified — 1 M		3M
5b.	collatz() function definition — 3M Input — 1M calling a function & printing the output — 3M		7

CITY ENGINEERIN COLLEGE

DEPARTMENT OF ....CSE.....

SCHEME FOR VALUATION

Internal Test I

Semester & Section: V A & B Date: 10-11-2021

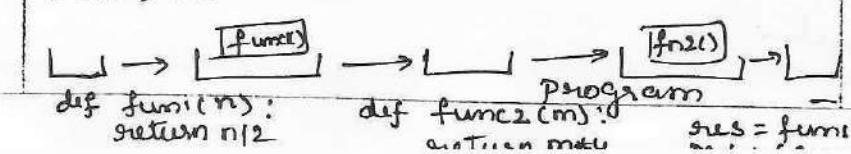
Question No.	Details of the Answer	Marks Distribution	Total Marks
6a.	If we don't want to crash the program due to errors instead, we want the program to detect errors, handle them, and then continue to run is called exception handling	– 1M	6M
	try & except clause	– 1M	
	program to solve division by zero error with explanation	– 4M	
6b.	== whether two values are same or not	1M	2M
	= puts the value on the right into the variable on the left	– 1M	
6C.	'Ihave eaten' + 99 + 'burritos' This can be fixed 'Ihave eaten' + str(99) + 'burritos'		
	Reason for getting error	– 1M	2M
	fixing the error	– 1M	
	PART-D		
7 a.	Using exception handling we can prevent a program from crashing	– 1M	5M
	Example	– 4M	
7b.	Definition of function to which converts string to float with try and except statements.	– 5M	5M

Staff Anil

ATTESTED COPY

HOD

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Question No.	Details of the Answer	Marks Distribution	Total Marks
8.	Comparison operators - used to compare two values and evaluate down to a single Boolean value.	- 1M	10M
	Boolean operators - used to compare two Boolean values.	- 1 M	
	Listing all the comparison operators and examples	- 4M	
	Listing all boolean operators with examples	- 4M	
	Part - E		
9.	Function is a named sequence of statements that perform computations. It is like a mini program defined by the user	- 1 M	10M
	Syntax: def function_name(parameters): Statements	- 2M	
	program to find the prime numbers within a given range.		
	Function definition	- 3M	
	Input	- 1M	
	Function call	- 1M	
	printing error message	- 1M	
	output	- 1M	
10 a.	Advantages of functions - All the logically related statements can be grouped together in one entity. This makes the program easy to read, understand and debug. - The repetition of frequently required code can be avoided by using function. - Dividing a long program into functions allows us to debug the parts one at a time and then assemble them into a single working program - Once the code of function is written and tested, we can reuse this code	4x1M	4M
10b.		- 2M - 4M	6M

V - 'A'

ADP (18CS55)

ATTENDANCE

Sl. No.	Reg.No.	Name	1/10	4/10	8/10	9/10	11/10	21/10	22/10	25/10	28/10	29/10	4/11	11/11	12/11	16/11
			2	1	2	1	1	4	1	1	4	1	4	4	1	1
			1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	1CE19CS001	AAKASH T E	1	2	3	4	5	6	A	A	7	A	8	9	10	11
2	002	ACHYUTH MAHESH HEGDE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
3	003	AFRID PASHA H P	1	2	3	4	5	6	7	8	9	10	11	12	13	14
4	004	AISHWARYA B M	1	2	3	4	5	6	A	A	7	8	9	10	11	A
5	005	AISHWARYA C	1	2	3	4	5	A	6	A	7	8	9	10	11	12
6	007	AMITH SINGH M	1	2	3	4	5	6	7	8	9	10	11	12	13	14
7	008	ANANYA BHOMBORE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8	009	APOORVA R SHET	1	2	3	4	5	6	A	A	7	8	9	10	11	12
9	010	ARSHAD ULAA Z	1	2	3	4	5	6	7	8	9	10	11	12	13	14
10	011	ARTEE KUMARI R	1	2	3	4	5	6	7	8	9	10	11	12	13	14
11	012	ASHWINI B	1	2	3	4	5	6	7	A	8	9	10	11	12	13
12	013	B M PUNEETH	1	2	3	4	5	6	7	8	9	10	11	12	13	14
13	014	BHANU PRAKASH R	1	2	3	4	5	6	7	8	A	9	10	11	12	A
14	015	BHAVANA S	1	2	3	4	5	6	A	7	A	8	9	10	11	12
15	016	BHOLAY NATH SINGH	1	2	3	4	5	A	6	7	8	9	10	11	12	13
16	017	BINDUSHREE G	1	2	3	4	5	6	7	8	9	10	11	12	13	14
17	018	CHANDAN KUMAR C	1	2	3	4	5	6	A	A	7	8	9	10	11	A
18	019	CHANDANA D V	1	2	3	4	5	6	7	8	9	10	11	12	13	A
19	020	CHANDINI R P	1	2	3	4	5	6	7	8	9	10	11	12	13	A
20	021	CHARANSIMHA D	1	2	3	4	5	6	7	8	9	10	11	12	13	A
21	022	CHETAN S	1	2	3	4	5	A	6	7	8	9	10	11	12	A
22	023	CHETHAN R	1	2	3	4	5	6	7	8	9	10	11	12	13	A
23	024	CHETHANRAJ H	1	2	3	4	5	6	7	8	9	10	11	12	13	14
24	025	CHIRANJEEVI V	A	1	2	3	4	5	6	7	A	A	8	9	10	11
25	026	DARSHAN K	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	No. of Abs.	ATTESTED COPY	01	00	00	00	00	03	05	06	03	02	00	00	06	08
	Initials		Ack	Ack	Ack	Ack	Ack	Ack	Ack	Ack	Ack	Ack	Ack	Ack	Ack	Ack

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ASSESSMENT

% of Attendance	Test Marks 1 (50)	Test Marks 2 (50)	Test Marks 3 (50)	30	Assgt (10)	Sessional Marks (40)	Remarks
86	21	22	35	16	10	26	
93	45	50	45	28	10	38	
93	33	43	33	22	10	32	
88	38	42	34	23	10	33	
86	31	15	32	16	10	26	
91	36	23	38	20	10	30	
91	43	45	42	26	10	36	
86	25	36	29	18	10	28	
91	27	27	25	16	10	26	
88	43	45	32	24	10	34	
86	24	13	26	13	10	23	
91	41	40	40	25	10	35	
86	38	41	42	25	10	35	
86	44	45	48	28	10	38	
86	48	39	49	28	10	38	
88	36	44	46	26	10	36	
88	20	15	28	13	10	23	
88	30	36	32	20	10	30	
86	40	13	36	18	10	28	
86	34	37	46	24	10	34	
86	28	37	35	20	10	30	
88	26	30	37	19	10	29	
86	24	22	11	12	10	22	
86	25	22	14	13	10	23	
86	29	22	25	16	10	26	
Ack	Ack	Ack	Ack	Ack	Ack	Ack	

V - A

ADP (18CS55)

ATTENDANCE

Sl. No.	Reg.No.		1/10	4/10	8/10	9/10	11/10	21/10	22/10	25/10	28/10	29/10	4/11	11/11	12/11	15/11
			2	1	2	1	1	4		1	4	1	4	4	1	1
			1	2	3	4	5	6	7	8	9	10	11	12	13	14
26	1CE19CS027	DEEPAK JADON	1	2	3	4	5	6	7	8	9	A	10	11	12	A
27	028	DEEPTHY RASHMI R	1	2	3	4	5	6	A	A	A	A	7	8	9	10
28	029	DHANUSH S	1	2	3	4	5	6	7	A	8	9	10	11	12	13
29	030	DIVYA S A	1	2	3	4	5	6	A	7	8	9	10	11	12	13
30	031	FOZAIL AHMED	1	2	3	4	5	A	6	7	8	9	10	11	12	13
31	032	GEETANSH P	A	1	2	3	4	5	A	A	6	7	8	9	10	A
32	033	HARISH BABU K P	1	2	3	4	5	6	7	8	A	9	10	11	12	A
33	034	HARSHITH G.R	1	2	3	4	5	6	7	8	9	10	11	12	13	A
34	035	HEMANTH V	1	2	3	4	5	6	7	8	A	9	10	11	12	A
35	037	IQRA FATHIMA	1	2	3	4	5	6	A	7	8	9	10	11	12	A
36	038	JANESHWAR D A	1	2	3	4	5	A	6	A	7	8	9	10	11	A
37	039	JEEVAN M	1	2	3	4	5	6	7	8	9	10	11	12	13	A
38	040	JYOTHI SHREE S R	1	2	3	4	5	A	A	6	7	8	9	10	11	12
39	041	KAVANA B	1	2	3	4	5	A	A	A	A	6	7	8	9	A
40	042	KEERTHI CHANDRA N L	A	1	2	3	4	A	A	A	5	A	6	7	8	A
41	043	KEERTHI KUMARI	1	2	3	4	5	6	7	A	8	9	10	11	12	13
42	044	KISHAN GOWDA	1	2	3	4	5	6	7	8	9	10	11	12	13	A
43	045	KRITHIKA N KOUSHIK	1	2	3	4	5	6	A	A	A	7	8	9	10	11
44	046	KRUTHIKA BHOMKAR	1	2	3	4	5	6	7	8	9	10	11	12	13	14
45	047	MANASA R	1	2	3	4	5	6	7	8	9	10	11	12	13	14
46	048	MANOHAR M	1	2	3	4	5	6	7	8	9	10	11	12	13	14
47	049	MANOJ M K	1	2	3	4	5	A	6	7	8	9	10	11	12	A
48	050	MANOJ R	1	2	3	4	5	6	7	A	8	9	10	11	12	A
49	051	MARIA MONICA P	1	2	3	4	5	6	7	8	9	10	11	12	13	A
50	052	MOHAMMED UZAIR BAIG	1	2	3	4	5	6	7	A	A	A	8	9	10	11
	No. of Abs.		02	00	00	00	00	06	08	10	05	04	00	00	00	14
	Initials	ATTESTED COPY	Abel	Abel	Abel	Abel	Abel	Abel	Abel	Abel	Abel	Abel	Abel	Abel	Abel	Abel

ASSESSMENT

Sl. No.	% of Attendance	Test Marks 1 (50)	Test Marks 2 (50)	Test Marks 3 (50)	30	10	Sessional Marks (25)	Remarks
26	86	33	28	36	20	10	30	
27	85	35	29	24	18	10	28	
28	86	19	29	30	16	10	26	
29	86	36	37	42	23	10	33	
30	86	49	48	49	30	10	40	
31	86	25	20	21	14	10	24	
32	88	18	14	32	13	10	23	
33	88	17	18	32	14	10	24	
34	88	18	15	33	14	10	24	
35	88	32	34	32	20	10	30	
36	86	36	25	26	18	10	28	
37	88	33	22	40	19	10	29	
38	88	28	29	30	18	10	28	
39	85	32	32	26	18	10	28	
40	85	AB	22	24	10	10	20	
41	88	27	28	37	19	10	29	
42	88	07	14	32	11	10	21	
43	88	36	40	30	22	10	32	
44	91	33	41	39	23	10	33	
45	91	32	34	47	23	10	33	
46	93	29	22	42	19	10	29	
47	88	10	15	37	13	10	23	
48	86	17	10	38	13	10	23	
49	88	33	24	48	21	10	31	
50	86	31	20	44	19	10	29	
	Abel	Abel	Abel	Abel	Abel	Abel	Abel	

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

V - 'A'

ADP (18CS55)

ATTENDANCE

ASSESSMENT

Sl. No.	Reg.No.	Name	1/10	4/10	8/10	9/10	11/10	21/10	22/10	25/10	28/10	29/10	4/11	11/11	12/11	15/11	60	% of Attendance	Test Marks 1 (50)	Test Marks 2 (50)	Test Marks 3 (50)	30	10	Sessional Marks 25	Remarks
			2	1	2	1	1	4	1	1	4	1	4	4	1	1									
			1	2	3	4	5	6	7	8	9	10	11	12	13	14									
51	1CE19CS056	MRUDULA S PRASAD	1	2	3	4	5	6	7	8	9	10	11	12	13	14		91	49	48	49	30	10	40	
52	057	MULGE RAHUL KUMAR	—	—	—	—	—	A	A	—	—	—	—	—	—	—			—	—	—	—	—	—	Shifted to B Sec
53	058	NISHANTH NAYAKA N R	1	2	3	4	5	6	7	A	A	A	8	9	10	A		86	23	10	34	14	10	24	
54	059	NITHIN RAJ GOWDA	—	—	—	—	—	A	A	—	A	—	—	—	—	—			—	—	—	—	—	—	Shifted to 'B' sectio
55	076	SAIMA SHEIK	1	2	3	4	5	6	A	7	8	9	10	11	12	13		86	33	25	31	18	10	28	
56	081	SHANKARALINGA M	1	2	3	4	5	6	A	A	A	A	7	8	9	A		85	13	16	38	14	10	24	
57	085	SPOORTHI H M	1	2	3	4	5	6	A	7	8	9	10	11	12	A		86	21	16	30	14	10	24	
58	092	SYED MUJAIB ULLA	1	2	3	4	5	6	7	8	9	10	11	12	13	14		86	30	23	37	18	10	28	
59	103	X SEMANTHA MERCY	1	2	3	4	5	6	7	8	9	10	11	12	13	14		86	43	24	38	21	10	31	
60																									
61																									
62																									
63																									
64																									
65																									
66																									
67																									
68																									
69																									
70																									
71																									
72																									
73																									
74																									
75																									
	No. of Abs.		00	00	00	00	00	00	03	02	02	02	00	00	00	03									
	Initials		Abs	Abs	Abs	Abs	Abs	Abs	Abs	Abs	Abs	Abs	Abs	Abs	Abs	Abs		Abs	Abs	Abs	Abs	Abs	Abs	Abs	

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

RECORD OF CLASS WORK

Date	Period	Topics Covered
1-10-2021	2	Module-1 Introduction
4-10-2021	1	Python Basics : Expressions, Data types
8-10-2021	2	String concateration, Replication, Variables
9-10-2021	1	First Program, Dissecting your program
11-10-2021	1	Flow Control: Boolean values, Comparison operators
21-10-2021	4	Elements of flow control, if, else, elif
22-10-2021	1	while, for loop, importing modules, sys.exit()
25-10-2021	1	Functions: def statement, Return values, None value
28-10-2021	4	Keyword arguments, print(), scope
29-10-2021	1	Global statement, Exception handling
4-11-2021	4	Module 2: Lists data type, Working with lists
11-11-2021	4	Augmented assignment Operators, Methods
12-11-2021	1	Example Program, Strings and Tuples
15-11-2021	1	References, Dictionary data type
18-11-2021	4	Pretty Printing, Model real world things
19-11-2021	1	Working with Strings, Useful String methods
25-11-2021	4	Examples, Pyperclip module
26-11-2021	1	Project: Password locker, Adding Bullets to wiki page
29-11-2021	1	Module 3: Finding patterns without Regular Expression & with RE
30-11-2021	4	More pattern Matching with RE, Greedy, Nongreedy
02-12-2021	4	findall() method, Character class, Regex Symbols
03-12-2021	1	Case Insensitive matching, sub(), Ignore case, dotall, verbose, project
23-12-2021	4	Files, Filepaths, os.path module
24-12-2021	1	File reading/writing, Shelve module, Saving variables with pprint.pformat

Teachers Signature

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

HOD'S Signature

V - 'A'

ADP - 18CS55

RECORD OF CLASS WORK

Date	Period	Topics Covered
27-12-2021	1	Random quiz files, multiclipboard, Shutil module
30-12-2021	1	walk(), compressing files, Raising exceptions
03-01-2022	1	Traceback, assertion, Logging, Debugger
04-01-2022	4	Module 4: classes and objects, attributes, copying
06-01-2022	4	Time, Pure functions, Modifiers, Prototyping
07-01-2022	2	Object Oriented features, Printing objects __init__, __str__ methods
10-01-2022	1	Operator overloading, Type based dispatch
13-01-2022	4	Polymorphism, interface and implementation
14-01-2022	1	Inheritance: card objects, class attributes comparing cards, Decks, Printing the deck
17-01-2022	1	Add, remove, shuffle and sort, inheritance class diagrams, Data encapsulation
19-01-2022	4	Module 5: Web scraping, web browser module, downloading and saving files
20-01-2022	4	HTML, Parsing - BeautifulSoup Module
21-01-2022	1	Controlling the Browser with the Selenium module
28-01-2022	1	Working with Excel Spreadsheets: Installing openpyxl module, Reading excel documents
31-01-2022	1	Reading data from Spreadsheets, Writing excel
03-02-2022	4	Updating a spreadsheet, Fonts, Formulas, adjusting rows and columns, charts
04-02-2022	1	Working with PDF and Word documents
07-02-2022	1	Working with CSV files and Jason data
10-02-2022	1	JSON and APIs, JSon module

Teachers Signature

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

HOD'S Signature

CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CIRCULAR

Ref. No: CEC/ECE/DAC/2021-2022/02 **Date: 21-03-2022**

All the members of Department Advisory Committee are informed to attend a meeting which will be held as follows

Date: 26-03-22
Time: 03.30 PM
Venue: **LAB A206**

Agenda:

- Certification course for 3rd year
- Organizing workshop for final year
- Conduction of Project Exhibition
- Industrial Visit
- Conduction of guest lectures/ workshops

Prof. Mallikarjuna G S

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Department Advisory Committee Meeting

Date: 26-03-2022
Time: 03.30 PM
Venue: LAB A206

DAC Members Present:

Sl. No	Member Name	Designation	Role	Signature
1	Prof. Mallikarjuna G S	HOD	Convenor	
2	Dr. Shalini Prasad	Professor	Co-Convenor	
3	Prof. Shylaja K	Assistant Professor	Member	
4	Prof. Ravindra S	Assistant Professor	Member	
5	Prof. Aurobindo Koti	Assistant Professor	Member	
6	Prof. SKL Narayana	Assistant Professor	Member	

The Department Advisory Committee meeting was conducted at Department of ECE, on 01st April 2022, at 03:30 PM.

Agenda of the Meeting:

- Conducting Certification courses
- Organizing workshop for final year
- Conduction of Project Exhibition
- Faculty development program
- Conduction of guest lectures/ workshops

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Minutes of Meeting:

In the Department Advisory Committee meeting, an overview of the department was presented, emphasizing student achievements, result analysis, and faculty accomplishments. The members discussed various suggestions for improvement and reviewed the meeting agenda.

The Committee proposed the following items for inclusion in the agenda:

- A Value added course has been recommended which is the future of Transportation.
- Second-year students are encouraged to participate in technical activities and to attend guest lectures or seminars to broaden their knowledge.
- A project exhibition has been proposed, offering final-year students a platform to showcase their work.
- To keep students and faculty updated with current technologies, the committee suggested organizing workshops, guest lectures, and hands-on sessions.

Prof. Mallikarjuna G S

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

VISION

Making Remarkable Contribution by Disseminating Knowledge on Emerging Trends in Engineering and Technology through various Programmes, Innovation and Research so as to Excel in Quality both at National and International level and to provide Career Guidance & Training for Employment.

MISSION

M1- To encourage Knowledge Acquisition and Foster Innovation & Research.

M2- To Prepare Students for Immediate Employment, leading to Technological and Socio- economical growth.

M3- To Provide Guidance for a Productive Career under various programmes.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

PROGRAM OUTCOMES (PO)

PO1 – Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2 – Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3 – Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4 – Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5 – Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6 – The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7 – Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8 – Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9 – Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10 – Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11 – Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12 – Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcome

Electronics & Communication Engineering: Analyze and Design analog & digital circuits or systems. Implement functional blocks of hardware-software co-designs for signal processing and communication applications.

Work with respect for societal values and concern for environment in implementing engineering solutions.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

Department of Electronics and Communication Engineering

COURSE ALLOCATION ACY:2021-22 (even)

Sl.No	Name of the Faculty	Course code and Name	Year& Semester	Signature
1	Prof. Mallikarjuna	18ELE23 - Electrical Engineering -2C	2021 - II	
2	Prof. Shylaja. K	17EC63 - VLSI design 17EC835 - Network Security 18ECL48 - Analog Communication Lab	2021 - VI 2021 - VIII 2021 - IV	
3	Prof. Shalini prasad	17EC62 - ARM Theory 18ELEL27 - Electrical lab - 2C 18EC62 - ARM Theory.	2021 - VI 2021 - II 2021 - VI	
4	Prof. Rewindra S	18EC45 - Signals & System. 17EC64 - Computer Communication Network 17ECL68 - CN Lab	2021 - IV 2021 - VI 2021 - VI	
5	Prof. Vishwakiran	17EC663 - DSD Verilog. 18ECL47 - MicroController lab	2021 - VI 2021 - IV	
6	Prof. Gopikishan J	17EC61 - Digital Communication 18EC81 - Digital Communication 17EC654 - Digital switching System 18ECL68 - CN Lab	2021 - VI 2021 - VI 2021 - VI 2021 - VI	
7	Prof. Madhavi J Kulkarni	18EC42 - Analog Communication 18ECL47 - MicroController Lab	2021 - IV 2021 - IV	
8	Prof. SKL Narayana	18EC63 - Microwave & Antenna 18ECL47 - MicroController lab	2021 - VI 2021 - IV	SKLN
9	Prof. Krishna .K.S.	17EC82 - Fiber optics & Network 18ELEL27 - Electrical lab - 2C	2021 - VIII 2021 - II	
10	Prof. Radhika	18ME653 - Supply Chain Management 17ECL67 - ARM lab	2021 - VI 2021 - VI	Radhika

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

11	Prof. Deepa Mathew	18ELN24 – Basic Electronics – 2A 18ECL67 – Communication Lab	2021-II 2021-VI	Deepa M
12	Prof. Geethanjalli	17EC81 – Wireless LTE 18ECL48 – Analog Communication lab	2021-VIII 2021-IV	Geethanjali
13	Prof. Sheethal	18EC46 – MicroController 17ECL67 – ARM lab	2021-IV 2021-VI	Sheethal
14	Prof. Aurbindo Koti	18ELN24 – Basic Electronics 18ECL66 – Electronics Devices lab	2021-II 2021-VI	Koti

HOD, ECE

Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road
Bangalore-560 061.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

ACADEMIC YEAR:2021-22 (even)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE PREFERENCE

Name of the Faculty: SKL Narayana . K.S

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1	18EC45 – Signals & System	III / 4th
2	18ECL47 - Microcontroller lab	III / 4th
3	18EC42 - Analog communication	II / 4th
4	17EC663 - DSD Verilog	III / 6th
5	17EC835 - Network Security	IV / 8th.

Signature of Faculty

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ
ಎತಾಯು ಅಧಿನಿಯಮ್ ೧೯೯೪ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ
"ಜ್ಞಾನ ಸಂಗಮ" ಮಚ್ಛೆ, ಬೆಳಗಾವಿ-590018

Visvesvaraya Technological University

(The State University of Govt. Karnataka, Established as per VTU Act 1994)
"JnanaSangama" Machhe, Belagavi-590018, www.vtu.ac.in

Dr. A. S. Deshpande B.E., Tech., Ph.D.
Registrar

Phone: (0831) 2498100
Fax: (0831) 2405467

Ref. No. VTU/BGM/BOS/2021-22/ 2759 Date: 22 AUG 2022

Revised-NOTIFICATION

Subject: -Revised Academic Calendar of Even semesters B.E./B.Tech./B.Plan./B.Arch. programs of University regarding...
Reference: Hon'ble Vice-Chancellor's approval dated: 22.08.2022

The revised academic calendar concerned to **even semesters of B.E./B.Tech./B.Plan./B.Arch.** programs of University are hereby notified as mentioned in the attached sheet;

The Principals of Affiliated, Constituent and Autonomous Engineering Colleges are hereby informed to bring the revised academic calendar to the notice of all concerned.

Encl: As mentioned

Sd/-
REGISTRAR

To,

1. The Principals of all affiliated/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering and Business Studies of the University.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director I/c. ITI SMU, VTU Belagavi for information and to make arrangements to upload revised Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. PS to Registrar VTU Belagavi
7. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi

22/8/2022
REGISTRAR

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Revised - Academic Calendar for EVEN Semester of UG programs for the year 2021-22

	VI semester B.E./B.Tech.	VI semester B.Arch.	VI semester B.Plan	VIII sem B.Arch	IV Semester B.Arch.	IV semester B. Plan	II semester B.E./B.Tech.	II semester B.Arch/B.Plan
Commencement of EVEN Semester	04.04.2022	04.04.2022	04.04.2022	04.04.2022	11.04.2022	11.04.2022	06.06.2022	06.06.2022
Last Working day of EVEN Semester	16.07.2022	16.07.2022	16.07.2022	23.07.2022	23.07.2022	23.07.2022	09.09.2022	09.09.2022
Practical/Viva-Examination	18.07.2022 To 29.07.2022	18.07.2022 To 29.07.2022	18.07.2022 To 29.07.2022	25.07.2022 To 30.07.2022	25.07.2022 To 30.07.2022	25.07.2022 To 30.07.2022	01.10.2022 To 10.10.2022	01.10.2022 To 10.10.2022
Theory Examinations	01.08.2022 To 20.08.2022	01.08.2022 To 20.08.2022	01.08.2022 To 20.08.2022	01.08.2022 To 20.08.2022	01.08.2022 To 20.08.2022	01.08.2022 To 20.08.2022	12.09.2022 To 30.09.2022	12.09.2022 To 30.09.2022
Internship	21.08.2022 To 10.09.2022	---	21.08.2022 To 10.09.2022		---	---	11.10.2022 To 30.10.2022	
Commencement of ODD semester	12.09.2022	12.09.2022	12.09.2022	01.09.2022	12.09.2022	12.09.2022	31.10.2022	31.10.2022

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Please Note:

- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by MHRD/UGC/AICTE/State Government.
- Academic Calendar is also applicable for **Autonomous Colleges.** In case any changes are to be effected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.

22/8/2022

REGISTRAR

CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2021-22 (EVEN SEM)

DAY	Date	APRIL	Date	MAY	Date	JUNE	Date	JULY	Date	AUGUST	Date	SEPTEMBER
THU											1	
FRI	1						1				2	
SAT	2	UGADHI					2				3	
SUN	3		1	LABOURS DAY			3				4	
MON	4	STARTING OF 6th& 8th Semesters	2				4	VTU Theory Exams for8th Semesters	1	VTU Theory Exams for	5	
TUE	5		3	BASAVA JAYANTHI / RAMZAN			5	04.07.2022 To 20.07.2022	2	6th&8th Semesters	6	
WED	6		4		1		6	THIRD INTERNAL ASSESSMENT	3	01.08.2022 To 20.08.2022	7	
THU	7		5		2		7	6th Semester	4		8	
FRI	8		6		3		8		5		9	
SAT	9	2ND SAT HOLIDAY	7		4		9	2ND SAT HOLIDAY	6		10	2ND SAT HOLIDAY
SUN	10		8		5		10		7		11	
MON	11		9	FIRST INTERNAL ASSESSMENT	6	SECOND INTERNAL ASSESSMENT	11		8		12	
TUE	12		10	6th&8th Semesters	7	6th&8th Semesters	12	Lab internals for 6thSem	9	MOHARAM	13	
WED	13		11		8		13		10		14	
THU	14	AMBEDKAR / MAHAVIR J	12		9		14		11		15	
FRI	15	GOOD FRIDAY	13		10		15		12		16	
SAT	16		14	2ND SAT HOLIDAY	11	2ND SAT HOLIDAY	16	Last Working day of 6th Sem16.07.2022 Alumni meet	13	2ND SAT HOLIDAY	17	
SUN	17		15		12		17		14		18	
MON	18		16		13	STARTING OF 1st Semester	18	VTU Practical Exams	15	INDEPENDENSE DAY	19	
TUE	19		17		14		19	6th Semesters	16		20	
WED	20		18		15		20	18.07.2022 To 29.07.2022	17		21	
THU	21		19		16		21		18		22	
FRI	22		20		17		22	GRADUATION DAY	19		23	
SAT	23	4th SAT HOLIDAY	21		18		23	4th SAT HOLIDAY	20		24	4th SAT HOLIDAY
SUN	24		22		19		24	Project, Internship Viva	21		25	
MON	25		23		20	Cultural, Sports Competitions, Ethnic Day	25	25.07.2022 To 30.07.2022	22	Commencement of ODD Sem 22.08.2022	26	
TUE	26		24		21	ANNUAL DAY	26		23		27	
WED	27		25		22		27		24		28	
THU	28		26		23		28		25		29	
FRI	29		27		24		29		26		30	
SAT	30		28	4th SAT HOLIDAY	25	4th SAT HOLIDAY	30		27	4th SAT HOLIDAY		
SUN			29		26	THIRD INTERNAL ASSESSMENT 8th	31	GANESHA FESTIVAL	28			
MON			30		27	Semester			29			
TUE			31		28				30			
WED					29	8TH SEMESTER "Project Exhibition"			31			
THU					30	Last Working day of 8th semester						

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, BANGALORE - 560 061

CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2021-22 (EVEN SEM)

DEPT OF E&CE

DAY	Date	APRIL	Date	MAY	Date	JUNE	Date	JULY	Date	AUGUST	Date	SEPTEMBER
THU											1	
FRI	1						1				2	
SAT	2	UGADHI					2				3	
SUN	3		1	LABOURS DAY			3				4	
MON	4	STARTING OF 6th& 8th Semesters	2				4	VTU Theory Exams for8th Semesters	1	VTU Theory Exams for	5	
TUE	5		3	BASAVA JAYANTHI / RAMZAN			5	04.07.2022 To 20.07.2022	2	6th&8th Semesters	6	
WED	6		4		1	SCI LAB WORKSHOP	6	THIRD INTERNAL ASSESSMENT	3	01.08.2022 To 20.08.2022	7	
THU	7		5		2		7	6th Semester	4		8	
FRI	8		6		3		8		5		9	
SAT	9	2ND SAT HOLIDAY	7		4		9	2ND SAT HOLIDAY	6		10	2ND SAT HOLIDAY
SUN	10		8		5		10		7		11	
MON	11		9	FIRST INTERNAL ASSESSMENT	6	SECOND INTERNAL ASSESSMENT	11		8		12	
TUE	12		10	6th&8th Semesters	7	6th&8th Semesters	12	Lab internals for 6thSem	9	MOHARAM	13	
WED	13		11		8		13		10		14	
THU	14	AMBEDKAR / MAHAVIR J	12		9		14		11		15	
FRI	15	GOOD FRIDAY	13		10		15		12		16	
SAT	16		14	2ND SAT HOLIDAY	11	2ND SAT HOLIDAY	16	Last Working day of 6th Sem16.07.2022 Alumni meet	13	2ND SAT HOLIDAY	17	
SUN	17		15		12		17		14		18	
MON	18	18th to 20th Technical Seminar presentation	16		13	STARTING OF 1st Semester	18	VTU Practical Exams	15	INDEPENDENSE DAY	19	
TUE	19		17		14		19	6th Semesters	16		20	
WED	20		18		15	15th & 18th semester Project Phase III presentation	20	18.07.2022 To 29.07.2022	17		21	
THU	21		19		16		21		18		22	
FRI	22		20		17		22	GRADUATION DAY	19	GUEST LECTURE 2	23	
SAT	23	4th SAT HOLIDAY	21		18		23	4th SAT HOLIDAY	20		24	4th SAT HOLIDAY
SUN	24		22		19		24	Project, Internship Viva	21		25	
MON	25		23	23rd to 24th 8th semester Internship presentation	20	Cultural, Sports Competitions, Ethnic Day	25	25.07.2022 To 30.07.2022	22	Commencement of ODD Sem 22.08.2022	26	
TUE	26	26th to 27th 8th semester Project Phase II presentation	24		21	ANNUAL DAY	26		23		27	
WED	27		25		22		27		24		28	
THU	28		26		23		28		25		29	
FRI	29		27		24		29		26		30	
SAT	30		28	4th SAT HOLIDAY	25	4th SAT HOLIDAY	30		27	4th SAT HOLIDAY		
SUN			29		26	THIRD INTERNAL ASSESSMENT 8th Semester	31	GANESHA FESTIVAL	28			
MON			30		27				29			
TUE			31	*INDUSTRIAL VISIT*	28				30			
WED					29	8TH SEMESTER "Project Exhibition"			31			
THU					30	Last Working day of 8th semester						

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Principal
City Engineering College,
Bangalore-560 061

CITY ENGINEERING COLLEGE

Doddakalasandra, Off. Kanakapura Main Road, Bangalore - 560062

Dept. of Electronics and Communication Engineering

Faculty Academic File

NAME: RAVINDRA.S / KRISHNA K.S

DESIGNATION: Assistant Professor

SEMESTER: 8th

SECTION: 'B'

SUBJECT NAME & CODE: 17E82 / 15EC82, Fiber Optics & networks

ACADEMIC YEAR: 2021-22

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE			
DEPT. OF ELECTRONICS & COMMUNICATION ENGINEERING			
ODD 2021-22	7TH B SEM EC	STUDENT LIST	
SL.NO.	SCHEME	USN	NAME
1	2017	1CE16EC020	MADAN HALAKATTI
2	2017	1CE16EC045	T U SOUMYA
3	2017	1CE17EC018	CHANDANA R
4	2017	1CE17EC023	DIVAKAR S D
5	2017	1CE17EC025	GOVARDHAN KN
6	2017	1CE17EC053	SANJAY H
7	2017	1CE17EC060	SHESHADRI
8	2017	1CE17EC061	SHYAM SUNDAR M G
9	2017	1CE17EC068	TEJASWINI ANANTH JANTHALI
10	2017	1CE17EC069	THANUSHREE R
11	2015	1CE16EC017	KAUSHIK A
12	2015	1CE16EC053	SAEEDA SHAMAEL
13	2015	1CE16EC401	AKSHAY HEGDE

Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Bangalore-560 061.

HOD, DEPT. OF E&CE

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

EVEN 2021-2022 TIME TABLE

SEMESTER: VIII B EC CBCS **2017 SCHEME** **CLASS ROOM: A105**

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:30 AM 10:20 AM	10:20AM 11:10 AM	11:10 AM 11:30 AM	11:30 AM 12:20 PM	12:20 PM 1:10 PM	1:10 PM 2:00 PM	2:00 PM 2:50 PM	2:50 PM 3:40 PM	3:40 PM 4:30 PM
MON	*17EC82*	*17EC835*	*BREAK*	*17EC81*		*LUNCH*	*Technical Seminar*		
TUE	*17EC82*	*17EC835*		*17EC81*			*Project Work - Internship*		
WED	*17EC835*	*17EC82*		*17EC835*			*Technical Seminar*		
THU	*Project Work*			*Project Work*			*Project Work*		
FRI	*Project Work*			*Project Work*			*Project Work*		
SAT	*Project Work*			*Project Work*			*Project Work*		

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
17EC81	Wireless Cellular and Lte 4G Broadband	Prof. Radhika
17EC82	Fiber Optics and networks	Prof. Krishna K. S
17EC835	Professional Elective-5 NS&CS	Prof. Aurabindo Koti
17EC84	Internship or Professional Practice	Prof. Vishva Kiran R C
17ECP85	Project Work	Prof. Shalini Prasad.
17ECS86	Seminar	Prof. Shylaja K, Prof. Ravindra S

TIMETABLE Co-ordinator

Professor & Head
Dept. of Electronics & Communication Engineering
City Engineering College,
Kanakapura Main Road
Bangalore-560 061.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Principal
City Engineering College,
Bangalore-560 061

FIBER OPTICS and NETWORKS

B.E., VIII Semester, Electronics &Communication Engineering
[As per Choice Based Credit System (CBCS) Scheme]

Course Code	**17EC82**	**CIE Marks**	**40**
Number of Lecture Hours/Week	**4**	**SEE Marks**	**60**
Total Number of Lecture Hours	**50(10 Hours / Module)**	**Exam Hours**	**03**

CREDITS – 04

Course Objectives: This course will enable students to:

- Learn the basic principle of optical fiber communication with different modes of light propagation.
  Understand the transmission characteristics and losses in optical fiber.
  Study of optical components and its applications in optical communication networks.
- Learn the network standards in optical fiber and understand the network architectures along with its functionalities.

Module -1

Optical fiber Communications: Historical development, The general system, Advantages of optical fiber communication, Optical fiber waveguides: Ray theory transmission, Modes in planar guide, Phase and group velocity, Cylindrical fiber: Modes, Step index fibers, Graded index fibers, Single mode fibers, Cutoff wavelength, Mode field diameter, effective refractive index. Fiber Materials, Photonic crystal fibers. (Text 2) **L1, L2**

Module -2

Transmission characteristics of optical fiber: Attenuation, Material absorption losses, Linear scattering losses, Nonlinear scattering losses, Fiber bend loss, Dispersion, Chromatic dispersion, Intermodal dispersion: Multimode step index fiber.

Optical Fiber Connectors: Fiber alignment and joint loss, Fiber splices, Fiber connectors, Fiber couplers. (Text 2) **L1, L2**

Module -3

Professor & Head
Dept. of Electronics & Communication Engineering
City Engineering College,
Kanakapura Main Road,
Bengaluru-560 061.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Optical sources: Energy Bands, Direct and Indirect Bandgaps, Light Emitting diodes: LED Structures, Light Source Materials, Quantum Efficiency and LED Power, Modulation. Laser Diodes: Modes and Threshold conditions, Rate equation, External Quantum Efficiency, Resonant frequencies, Laser Diode structures and Radiation Patterns: Single mode lasers.

Photodetectors: Physical principles of Photodiodes, Photodetector noise, Detector response time.

Optical Receiver: Optical Receiver Operation: Error sources, Front End Amplifiers, Receiver sensitivity, Quantum Limit. (Text 1) **L1, L2**

Module -4

WDM Concepts and Components: Overview of WDM: Operational Principles of WDM, WDM standards, Mach-Zehnder Interferometer Multiplexers, Isolators and Circulators, Fiber grating filters, Dielectric Thin-Film Filters, Diffraction Gratings, Active Optical Components, Tunable light sources,

Optical amplifiers: Basic application and Types, Semiconductor optical amplifiers, Erbium Doped Fiber Amplifiers, Raman Amplifiers, Wideband Optical Amplifiers. (Text 1) **L1, L2**

Module -5

Optical Networks: Optical network evolution and concepts: Optical networking terminology, Optical network node and switching elements, Wavelength division multiplexed networks, Public telecommunication network overview. Optical network transmission modes, layers and protocols: Synchronous networks, Asynchronous transfer mode, OSI reference model, Optical transport network, Internet protocol, Wavelength routing networks: Routing and wavelength assignment, Optical switching networks: Optical circuit switched networks, packet switched networks, Multiprotocol Label Switching, Optical burst switching networks, Optical network deployment: Long-haul networks, Metropoliton area networks, Access networks, Local area networks. (Text 2) **L1, L2**

Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Kanakapura Main Road,
Bangalore-560 061.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Course Outcomes: At the end of the course, students will be able to:

1. Classification and working of optical fiber with different modes of signal propagation.
2. Describe the transmission characteristics and losses in optical fiber communication.
3. Describe the construction and working principle of optical connectors, multiplexers and amplifiers.
4. Describe the constructional features and the characteristics of optical sources and detectors.
5. Illustrate the networking aspects of optical fiber and describe various standards associated with it.

Text Books:

1. Gerd Keiser , Optical Fiber Communication, 5th Edition, McGraw Hill Education(India) Private Limited, 2015. ISBN:1-25-900687-5.
2. John M Senior, Optical Fiber Communications, Principles and Practice, 3rd Edition, Pearson Education, 2010, ISBN:978-81-317-3266-3

Reference Book:

Joseph C Palais, Fiber Optic Communication , Pearson Education, 2005, ISBN:0130085103

Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Kanakapura Main Road,
Bangalore-560 061.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGNEERING COLLEGE
Doddakalsandra, Off kanakapura road,
Bangalore 560 061.

Course Title: Fiber Optics & Networks	Course Code : 17EC82
Total contact hours: L:T:P:S :: 4:0:0:1	SEE Marks : 60
CIE Marks : 40	
Semester : VIII	Academic year : 2018-19
Lesson plan Author: Ravindra.S	Date : 1/02/2019

COURSE OBJECTIVE:

This course will enable students to:

- Learn the basic principle of optical fiber communication with different modes of light propagation.
- Understand the transmission characteristics and losses in optical fiber.
- Study of optical components and its applications in optical communication networks.
- Learn the network standards in optical fiber and understand the network architectures along with its functionalities.

COURSE OUTCOME:

This course will enable you to:

- Describe The basic components in an optical system
- Explain the operation of optical data generation, transmission, amplification, and detection.
- Design and analyze a viable optical transmission system.
- Evaluate signal-to-noise ratios and system power penalties
- Understand the basic concepts of reconfigurable multi-wavelength optical systems and networks
- Define several degrading effects in high-speed optical fiber transmission.

Professor & Head
Dept. of Electronics & Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road,
Bangalore-560 061.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Name of the Faculty: Ravindra.S LESSON PLAN ACADEMIC YEAR: 2018-19

	Days	Modules	Main Topics	Sub Topics	Bloom's Taxonomy Level(L)	Course Outcome (CO)
1	1	I	Optical fiber Communications	Historical development, The general system, Advantages of optical fiber communication, Optical fiber waveguides	L1, L2	CO1
	2			Ray theory transmission, Modes in planar guide, Phase and group velocity	L1, L2	CO1
	3			Cylindrical fiber: Modes, Step index fibers,	L1, L2	CO1
	4			Graded index fibers, Single mode fibers, Cutoff wavelength,	L1, L2	CO1
2	1	I	Optical fiber Communications	Mode field diameter,	L1, L2	CO1,CO3
	2			effective refractive index.	L1, L2	CO1,CO3
	3			Fiber Materials, Photonic crystal fibers. Photonic crystal	L1, L2	CO1,CO3
	4			, fiber optic cables specialty fibers.	L1, L2	CO1,CO3
3	1	II	Transmission characteristics of optical fiber	Attenuation, Material absorption losses, Linear scattering losses, Nonlinear	L1,L2	CO1, CO2
	2			Fiber bend loss, Dispersion, Chromatic dispersion, Intermodal dispersion: Multimode	L1,L2	CO1,CO2
4	1	II	Optical Fiber Connectors	Fiber alignment and joint loss, Fiber splices, Fiber connectors, Fiber	L1, L2	CO1,CO2
	2				L1, L2	CO1,CO2
5	1	III	Optical sources Photodetectors	Energy Bands, Direct and Indirect Bandgaps, Light Emitting diodes: LED Structures, Light	L1, L2	CO1,CO5

Professor & Head
Dept. of Electronics & Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road,
Bangalore-560 061.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

	2		Optical Receiver	Quantum Efficiency and LED Power, Modulation. Laser Diodes: Modes and Threshold conditions, Rate equation,	L1, L2	CO1,CO5
6	1	III		Resonant frequencies, Laser Diode structures and Radiation Patterns: Single mode	L1, L2	CO5
7	1	III		Physical principles of Photodiodes, Photodetector noise, Detector response	L1, L2	CO1,CO2
	2			Optical Receiver Operation: Error sources, Front End Amplifiers, Receiver	L1, L2	CO1,CO2
8	1	IV	WDM Concepts and Components	Overview of WDM: Operational Principles of WDM,	L1, L2	CO1,CO2
	2			WDM standards, Mach-Zehnder Interferometer	L1, L2	CO1,CO2
9	1	IV		Isolators and Circulators, Fiber	L1, L2	CO6
10	1	IV	Optical amplifiers	Dielectric Thin-Film Filters, Diffraction	L1, L2	CO6
	2			Active Optical Components, Tunable light sources,	L1, L2	CO6
	3			Basic application and Types, Semiconductor optical amplifiers, Erbium Doped Fiber	L1, L2	CO6
11	1	IV		Raman Amplifiers, Wideband Optical Amplifiers.	L1, L2	CO6
12	1	V	Optical Networks	Optical network evolution and concepts: Optical	L1, L2	CO6
	2			Optical network node and switching	L1, L2	CO6
	3			Public telecommunication network overview. Optical network	L1, L2	CO6

Professor & Head
Dept. of Electronics & Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road,
Bangalore-560 061.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

	4			Asynchronous transfer mode, OSI reference model, Optical transport network.	L1, L2	CO6
13	1	V	**Optical Networks**	Routing and wavelength assignment, Optical switching networks:	L1, L2	CO6
	2			packet switched networks, Multiprotocol Label Switching, Optical	L1, L2	CO6
	3			Optical network deployment: Long-haul networks,	L1, L2	CO1,CO4
	4			Metropoliton area networks, Access networks, Local area networks.	L1, L2	CO1,CO4

Bloom's Taxonomy Level (L)
L1-Remembering L2-Understanding L3-Applying L4-Analysing L5-Evaluating L6-Creating

TEXT BOOKS:

1. **"Optical Fiber Communication"**, Gerd Keiser, 4th Ed., MGH, 2008.
2. **"Optical Fiber Communications"**, John M. Senior, Pearson Education. 3rd Impression, 2007.

REFERENCE BOOK:

1. **Fiber Optic Communication** - Joseph C Palais: 4th Edition, Pearson Education.

Professor & Head
Dept. of Electronics & Communication Engineering
City Engineering College,
Kanakapura Main Road,
Bangalore-560 061.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN | 1 | C | E | | | | | | | |

COURSE CODE: **15EC82/17EC82**

CITYENGINEERING COLLEGE

Kanakapura Road, Doddakallasandra, Bengaluru - 560062

FIRST INTERNAL TEST

Programme: ECE
Course Name: Fiber Optics & Networks
Sem: VIII "A"
Duration: 1 ½Hrs

Date: 17/05/2021
Time: 10:30AM – 12:00 PM

MAX MARKS: 50

Note: Answer any FIVE questions choosing at least ONE from each Part.

			CO'S	BT'S
	Part – A			
1.	Derive the expression for Numerical Aperture using Ray theory.	10	CO1	BT1,BT 2
	Or			
2.	(a) what are the advantages & disadvantages of optical fiber communication. (b) A silica optical fiber with a core diameter large enough to be considered by ray theory analysis has a core refractive index of 1.5 .A light ray is incidented at the core-cladding interface with a critical angle of 78.5° Estimate: (i) Refractive index of cladding (ii) Numerical aperture (iii) The acceptance angle in the air for the fiber.	10	CO1	BT1,BT 2
	Part – B			
3.	Describe with neat diagram different types of optical fiber waveguides. Using ray theory explains the propagation of light inside the fiber.	10	CO1	BT1,BT 2
	Or			
4.	Derive necessary mathematical condition that the angle of incidence 'O' must satisfy for the optical skew ray to propagate in a step index fiber.	10	CO1	BT1,BT 2
	Part-C			
5.	(a) In brief discuss the different design approaches for single mode fibers (b) Calculate the number of modes of an optical fiber having diameter of 50μm,η1=1.48, η2=1.46 & wavelength 'λ' of 820ηm.	10	CO1	BT1,BT 2
	Or			
6.	Explain the following: (i) Modes in a planar guide (ii) Phase & group velocity	10	CO1	BT1,BT 2
	Part-D			
7.	Explain briefly about Graded index fibers.	10	CO1	BT1,BT 2
	Or			
8.	Explain briefly about Photonic crystal fibers.	10	CO1	BT1,BT 2
	Part-E			
9.	Explain the modes in cylindrical fiber & also write the wave equation ,electric field ,U,W, & V parameter.	10	CO1	BT1,BT 2
	Or			
10	w.r.t single mode fiber explain the following: (i) Cut off wavelength (ii) Mode field diameter (iii) Effective refractive index.	10	CO1	BT1,BT 2

Blooms Taxonomy Levels (BTL):
BT1-Remembering **BT2**- Understanding **BT3** – Applying **BT4** – Analyzing **BT5**- Evaluating

Course Outcomes (CO's):

CO5 : **Introduction to optical fibers, Total internal reflection , different types, photonic crystal fibers .**

Professor & Head
Dept. of Electronics & Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road,
Bengaluru-560 061.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

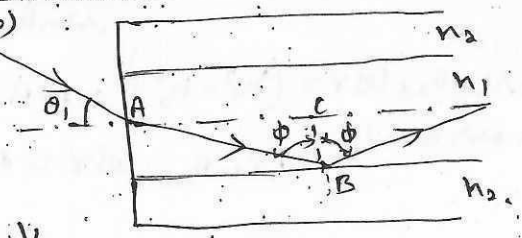
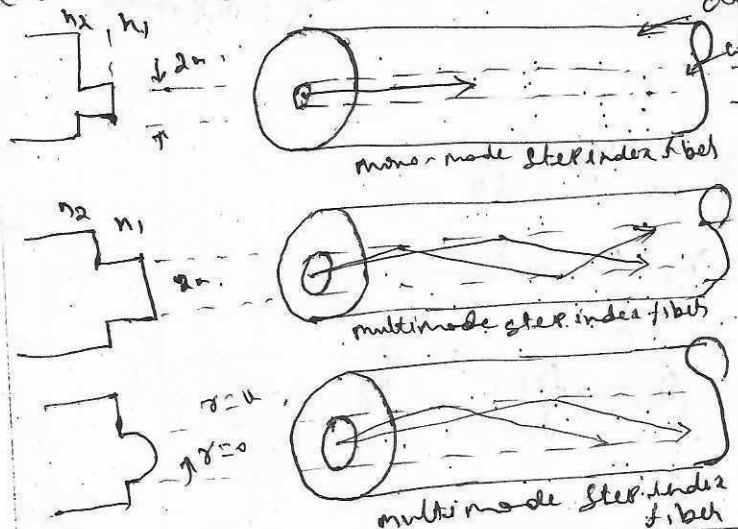
CITY ENGINEERING COLLEGE

DEPARTMENT OF Electronics & Communication

SCHEME FOR VALUATION

Internal Test # 1

Semester & Section: 8th A Fiber Optics & Networks (17EC82) Date: 18-5-22

Question No.	Details of the Answer	Marks Total Distribution	Total Marks
1	$n_0 \sin\theta_1 = n_1 \sin\theta_2$ $\phi = \frac{\pi}{2} - \theta_2$. $n_0 \sin\theta_1 = n_1 \cos\phi$ $n_0 \sin\theta_1 = n_1 (1 - \sin^2\phi)^{1/2}$. $n_0 \sin\theta_a = (n_1^2 - n_2^2)^{1/2}$. $NA = n_0 \sin\theta_a = (n_1^2 - n_2^2)^{1/2}$ (i) $NA = n_1 (2\Delta)^{1/2}$. 	— 02 — — 02 — — 03 — — 03	10.
2 (a)	* Enormous potential BW * Electrical isolation * Small size & weight * Signal Security. * Low transmission.	— 05 — — 05 —	10.
(b)	Given $(\theta_c = 78.5$ $\sin\phi_c = \frac{n_2}{n_1}$ $\Rightarrow n_2 = 1.47$ (cladding) $n_1 = 1.5$ (core) (ii) $NA = (n_1^2 - n_2^2)^{1/2} = 0.30$. (iii) $\theta_a = \sin^{-1} NA = \sin^{-1} 0.30 = 17.4°$.		
3.		2 ✓ ↓ 325-400 μm 50-200 μm 3+1 50-100 μm. 3+1	10

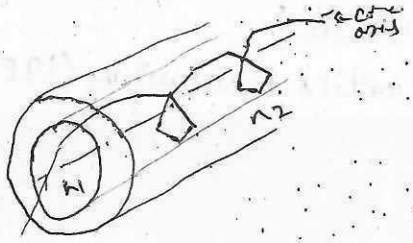
Ravindra S
Staff

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

HOD

Question No.	Details of the Answer	Marks Total Distribution	Total Marks

4



$\cos\gamma \sin\theta = \cos\phi$ — 02

$\cos\gamma \sin\theta = \cos\phi = (1 - \sin^2\phi)^{1/2}$ — 02

$\cos\gamma \sin\theta \le \cos\phi_c = \left(1 - \frac{n_2^2}{n_1^2}\right)^{1/2}$ — 02

10

$n_0 \sin\theta_a = n_1 \sin\theta$

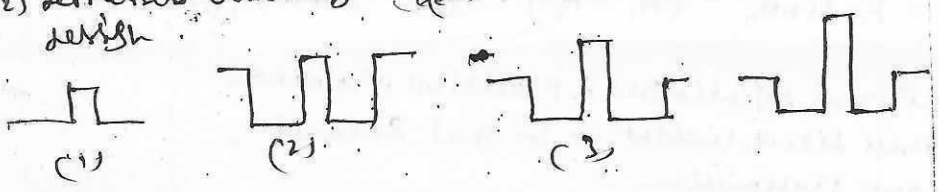
$\sin\theta_{as} = \frac{n_1}{n_0} \cdot \frac{\cos\phi_c}{\cos\gamma} = \frac{n_1}{n_0 \cos\gamma} = \left(1 - \frac{n_2}{n_1}\right)^{1/2}$ — 02

$n_0 \sin\theta_{as} \cos\gamma = (n_1^2 - n_2^2)^{1/2} = NA$ — 02

* for air with $n_0 = 1$, $\sin\theta_{as} \cdot \cos\gamma = NA$

5. (a) (1) Conventional matched cladding design (2) Segmented core matched cladding design. — 05

(2) Depressed cladding design ~~(3) Graded profile~~.

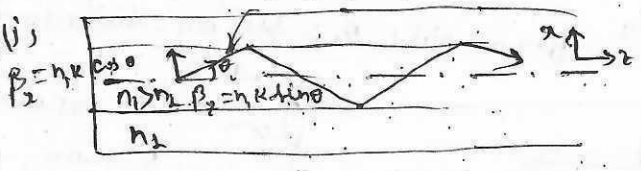


— 05

10

(b) $V = \frac{2\pi}{\lambda} a n_1 (2\Delta)^{1/2}$; $n_g = \frac{V'}{\lambda} =$

6. (i)



$\beta_z = n_1 k \cos\theta$

$\beta_z = n_1 k \sin\theta$ — 05

10

(ii) $v_p = \frac{\omega}{\beta}$; $v_g = \frac{\delta\omega}{\delta\beta}$ — 02

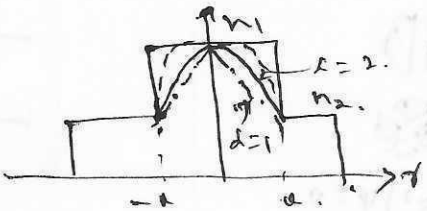
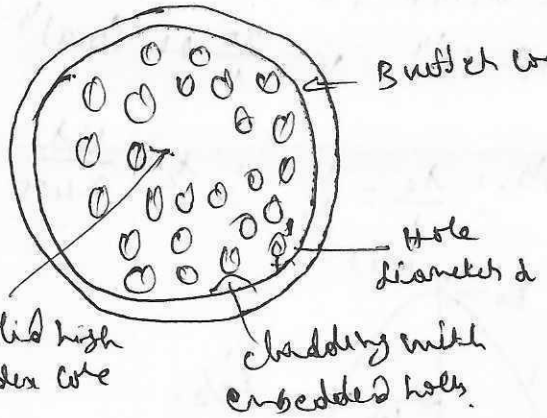
$\beta = n_1 \frac{2\pi}{\lambda} = \frac{n_1 \omega}{c}$ — 01

$v_g = \frac{c}{\left(n_1 - \lambda \frac{dn_1}{d\lambda}\right)} = \frac{c}{N_g}$ — 02

Ramakrishna
Staff

ATTESTED COPY
skaveri
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

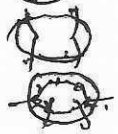
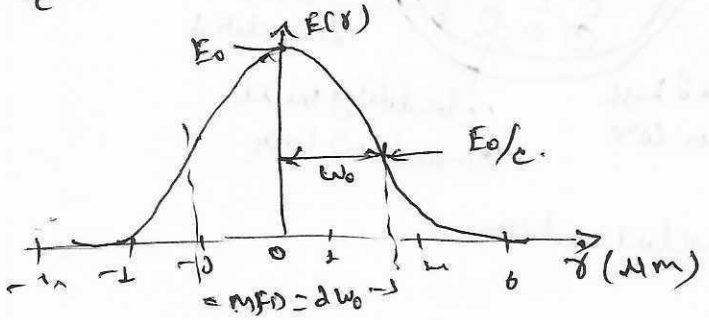
S. Malikarjun
HOD

Question No.	Details of the Answer	Marks Total Distribution	Total Marks
7	Graded index fibers — Depth.	—02—	10.
	$n(r) = \begin{cases} n_1(1-2\Delta(r/a)^\alpha)^{1/2} & : r \le a \text{ (core)} \\ n_1(1-2\Delta)^{1/2} & : r \ge a \text{ (cladding)} \end{cases}$	—02—	
		— 02—	
		—02—	
		—02—	
	$E_1 = \frac{1}{2}\{G_1(r)\exp[jS(r)] + G_2(r)\exp[j.S(r)]\}\left(\frac{\cos\psi}{\sin\psi}\right)\cos(\omega t)$		
8		—05—	10.
	Explanation.	—05	

Ravindra S.
Staff

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

HOD

Question No.	Details of the Answer	Marks Total Distribution	Total Marks
9.	LP_{01} HE_{11}  	–02–	
	$LP_{11}\begin{cases} TE_{01} \\ TM_{01} \\ HE_{21} \end{cases}$  	–02–	10
		–02–	
	$LP_{21}\begin{cases} EH_{11} \\ HE_{31} \end{cases}$  	–02–	
		–02–	
	$\frac{d^2\psi}{d\gamma^2} + \frac{1}{\gamma}\frac{d\psi}{d\gamma} + \frac{1}{\gamma^2}\frac{d^2\psi}{d\phi^2} + (n_1^2k^2 - \beta^2)\psi = 0$		
	$E(\gamma) = C J_1(UR)$ $U = a(n_1^2k^2 - \beta^2)^{1/2}$ $W = a(\beta^2 - n_2^2k^2)^{1/2}$.		
	$V = (U^2 + W^2)^{1/2} = ka(n_1^2 - n_2^2)^{1/2}$, $V = \frac{2\pi}{\lambda} a n_1 (2\Delta)^{1/2}$		
10.	(i) $\lambda_c = \frac{2\pi a n_1}{V_c}(2\Delta)^{1/2}$. ; $\frac{\lambda_c}{\lambda} = \frac{V}{V_c}$ $\therefore \lambda_c = \frac{V\lambda}{2.405}$	–03–	
	(ii) 	–04–	10.
	(iii) $\beta\lambda_{01} = 2\pi$ (or) $\lambda_{01} = \frac{2\pi}{\beta}$	–03–	
	$n_{eff} = \frac{\beta}{k}$, $\lambda_{01} = \frac{\lambda}{n_{eff}}$		
	$b = \frac{\beta^2 - n_2^2k^2}{n_1^2k^2 - n_2^2k^2}$		

Staff

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

HOD

USN | 1 | C | E | | | | | | | |

COURSE CODE: **15EC82/17EC82**

CITYENGINEERING COLLEGE

Kanakapura Road, Doddakallasandra, Bengaluru - 560062

SECOND INTERNAL TEST

Programme: ECE
Course Name: Fiber Optics & Networks
Sem: VIII "A"
Duration: 1 ½Hrs

Date: 6/06/2022
Time: 10:30AM – 12:00 PM

MAX MARKS: 50

Note: Answer any FIVE questions choosing at least ONE from each Part.

			CO'S	BT'S
	Part – A			
1.	**Explain about material absorption losses in an optical fiber.**	**10**	**CO1**	**BT1,BT 2**
	Or			
2.	**Explain the fiber bend loss with relevant diagram and expression.**	**10**	**CO1**	**BT1,BT 2**
	Part – B			
3.	**Explain intermodal dispersion with suitable diagram .show paths taken by the axial and an extreme meridional ray in a perfect multimode step index fiber.**	**10**	**CO1**	**BT1,BT 2**
	Or			
4.	**Explain linear and non-linear scattering losses in optical fibers.**	**10**	**CO1**	**BT1,BT 2**
	Part-C			
5.	**A four part multi mode fiber FBT coupler has 60μW optical power launched into part 1,th,the measured output powers at port 2,3 & 4 are 0.004,26.0 and 27 μW respectively .Determine the excess loss ,insertion losses between input and output ports the cross talk and split ration for the devices.**	**10**	**CO1**	**BT1,BT 2**
	Or			
6.	**What are different types of splicing & explain V-groove optical fiber splicing technique.**	**10**	**CO1**	**BT1,BT 2**
	Part-D			
7.	**Explain macro bending and micro bending losses with a neat diagram.**	**10**	**CO1**	**BT1,BT 2**
	Or			
8.	**Explain briefly about chromatic dispersion within optical fiber.**	**10**	**CO1**	**BT1,BT 2**
	Part-E			
9.	**Explain the different types of mechanical misalignment between the fibers.**	**10**	**CO1**	**BT1,BT 2**
	Or			
10	**Explain the structure of double hetero structure light emitter showing energy diagram and refractive index profile.**	**10**	**CO1**	**BT1,BT 2**

Blooms Taxonomy Levels (BTL):
BT1-Remembering **BT2**- Understanding **BT3** – Applying **BT4** – Analyzing **BT5**- Evaluating

Course Outcomes (CO's):

CO5 : Different types of losses, absorption mechanism, mechanical misalignment, fiber splicing

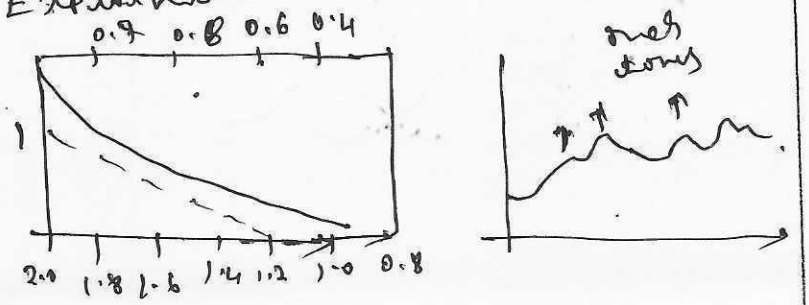
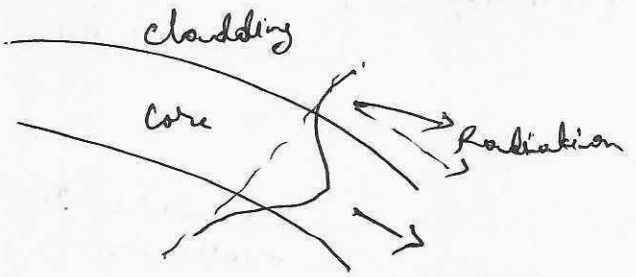
ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERIN COLLEGE
DEPARTMENT OF ..Electronics & Communication.

SCHEME FOR VALUATION #1.

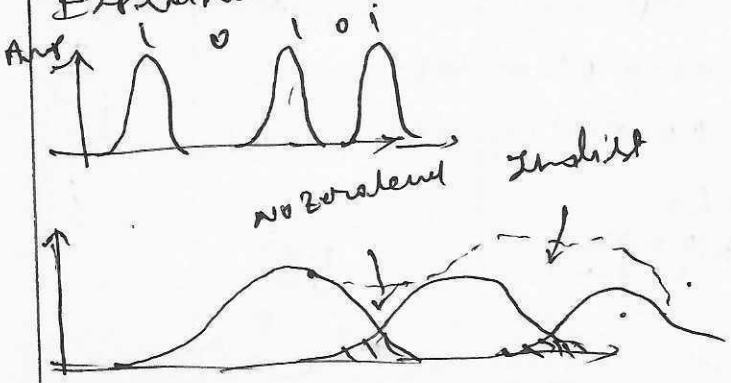
Semester & Section: 8th, 'B' Internal Test #2 Date: 6/6/2022.

Question No.	Details of the Answer	Marks Distribution	Total Marks
1	Intrinsic absorption loss Extrinsic absorption loss Explanation 	5 + 5	10
2.	 Explanation. $\alpha_r = C_1 \exp(-C_2 R)$ $R = \frac{3n_1^2 \lambda}{4\pi (n_1^2 - n_2^2)^{3/2}}$	05 03 02	10

Ravindra S.
Staff

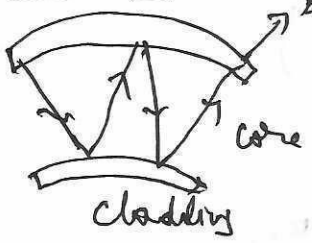
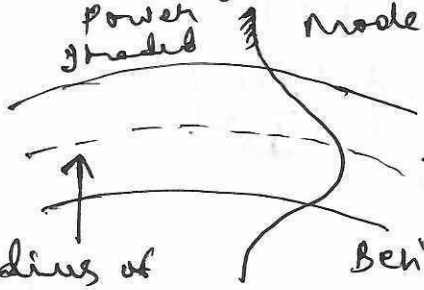
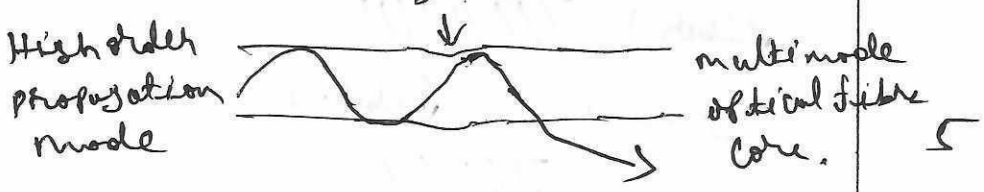
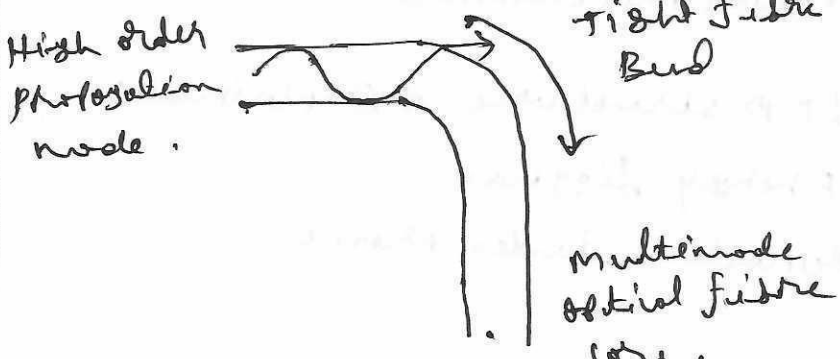
ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

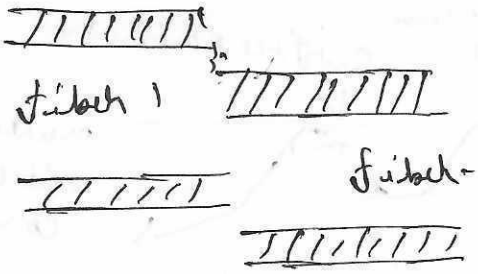
HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
3	$B_T \leq \frac{1}{2\tau}$ · $B_T(max) = \frac{0.2}{\sigma}$ bits^{-1}	—03—	
	$B_T(max) = 2B$	05	10
	Explanation		
		—02—	
4	Linear scattering loss → Rayleigh loss; → Mie scattering	5+5	10.
	Non-Linear scattering → Stimulated Brillion scattering; → Stimulated Raman scattering		
	Explanation		
5.	Excess loss = $\frac{P_i}{P_3+P_4}$	insertion loss P_1 to P_3 = 3.63dB	
		P_1 to P_4 = $\frac{P_1}{P_4} = 10\log\frac{P_1}{P_2}$	
	$10\log_{10}\frac{P_i}{P_3+P_4}$	cross talk = $10\log_{10}\frac{P_2}{P_1}$	5+5
	$10\log_{10}\frac{60}{26.0+27.5}$	cross talk = -41.76dB	
	Excess loss = 0.50dB		

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Question No.	Details of the Answer	Marks Distribution	Total Marks
6	micro bending  $-(\frac{\alpha_n}{\alpha}) = \left[1 \times \Delta \left(\frac{b}{a}\right)^{\frac{1}{2}} \frac{E_d}{E_z}\right]^{-2}$ Explaination	.5	10
7	micro bending power Graded  Radius of	5	
	micro bending.  Explaination	5	
	micro bending  Explaination	5	10

Question No.	Details of the Answer	Marks Distribution	Total Marks
8	Material dispersion, waveguide dispersion $\tau_g = \frac{d\beta}{d\omega} = \frac{1}{c}\left(n_1 - \lambda \frac{dn_1}{d\lambda}\right)$ $\tau_m = \frac{L}{c}\left(n_1 - \lambda \frac{dn_1}{d\lambda}\right)$ $\sigma_m = \sigma_\lambda \frac{d\tau_m}{d\lambda} + \sigma_\lambda \frac{2 d^2 \tau_m}{d\lambda^2} + \ldots$ $\sigma_m = \frac{\sigma_\lambda L}{c}\left\lvert \lambda \frac{d^2 n_1}{d\lambda^2} \right\rvert$ $m = \frac{1}{L}\frac{d\tau_m}{d\lambda} = \frac{1}{c}\left\lvert \frac{d^2 n_1}{d\lambda^2} \right\rvert$	-02- -02- -02- -02- -02-	10
9	Extrensic losses mechanical misalignment  Lateral misalignment Longitudinal misalignment Angular misalignment	2 2 3+3	10.
10.	LED structure + Explaination Energy diagram Refractive index profile.	-05 -03 -02.	10.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN | 1 | C | E | | | | | | | |

COURSE CODE: **15EC82/17EC82**

CITYENGINEERING COLLEGE

Kanakapura Road, Doddakallasandra, Bengaluru - 560062

THIRD INTERNAL TEST

Programme: ECE
Course Name: Fiber Optics & Networks
Sem: VIII "B"
Duration: 1 ½Hrs

Date: 28/06/2022
Time: 10:30AM – 12:00 PM

MAX MARKS: 50

Note: Answer any FIVE questions choosing at least ONE from each Part.

			CO'S	BT'S
	Part – A			
1.	Explain the operational principle and implementation of WDM diagram.	10	CO1	BT1,BT2
	Or			
2.	Explain the amplification mechanism in EDFA amplifier with the help of energy band diagram.	10	CO1	BT1,BT2
	Part – B			
3.	Explain the operation of Wide band amplifier representing two different band amplifiers in parallel and in series.	10	CO1	BT1,BT2
	Or			
4.	Write short note on optical fibre access networks and local area networks.	10	CO1	BT1,BT2
	Part-C			
5.	Explain optical fibre network fibre evaluation with suitable diagrams	10	CO1	BT1,BT2
	Or			
6.	Briefly, explain the basic structure of optical network and also four network terminology with diagram.	10	CO1	BT1,BT2
	Part-D			
7.	Explain about synchronous networks with STS frame structure.	10	CO1	BT1,BT2
	Or			
8.	Explain with neat diagrams, wavelength convertible routing network architecture.	10	CO1	BT1,BT2
	Part-E			
9.	Briefly, explain the basic structure of optical network and also four network terminology with diagram.	10	CO1	BT1,BT2
	Or			
10	Explain optical Circulators and optical add drop multipliers in detail.	10	CO1	BT1,BT2

Blooms Taxonomy Levels (BTL):
BT1-Remembering BT2- Understanding BT3 – Applying BT4 – Analyzing BT5-Evaluating

Course Outcomes (CO's):
CO5: Describe the construction and working principle of optical connectors, multiplexers and amplifiers, illustrate the networking aspects of optical fibre and describe various standards associated with it.

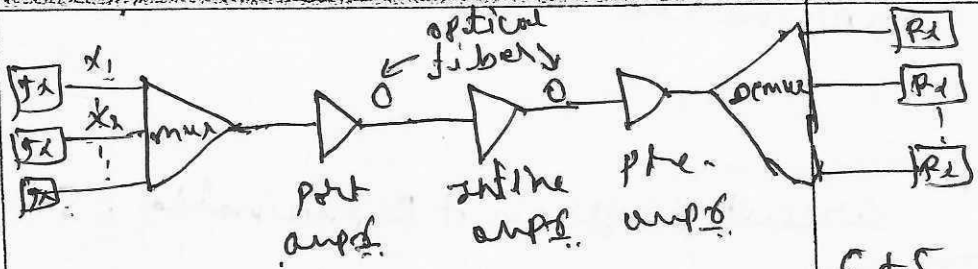
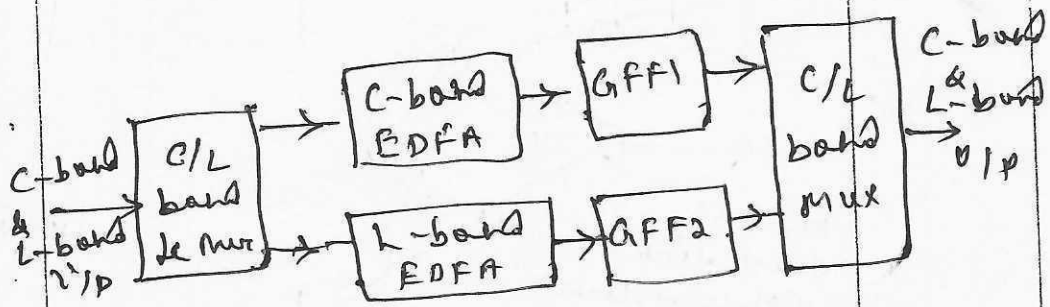
ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERIN COLLEGE
DEPARTMENT OF . Electronics & Communication.

SCHEME FOR VALUATION

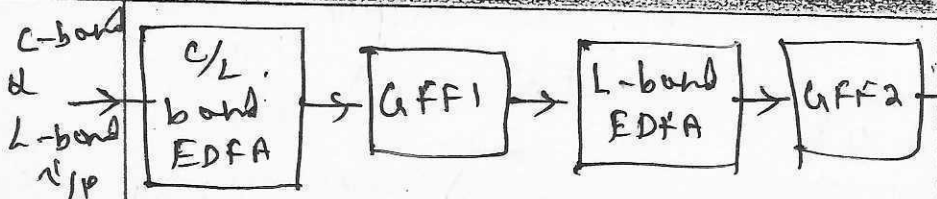
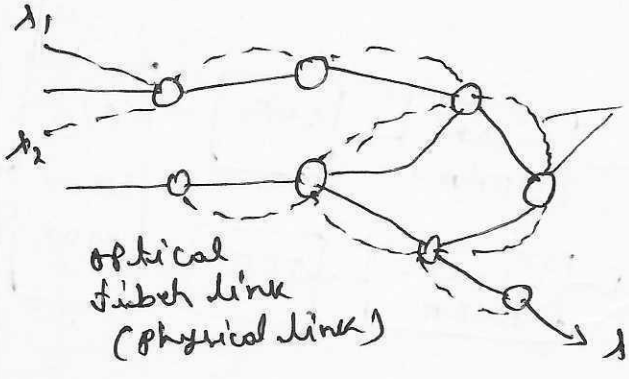
Semester & Section: 8th A & B Internal Test #3 Date:

Question No.	Details of the Answer	Marks Distribution	Total Marks
1		5+5	10
	Explanation		
2.	Figure + Explanation.	6+4	
3.			

Ravindra S.
Staff

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

G.S. Nalinakumar
HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
			
	Explanation	6+4	10
4.	Circuit diagram + Explanation	5+5	10
5			
	Explanation	4+6	10

ATTESTED COPY

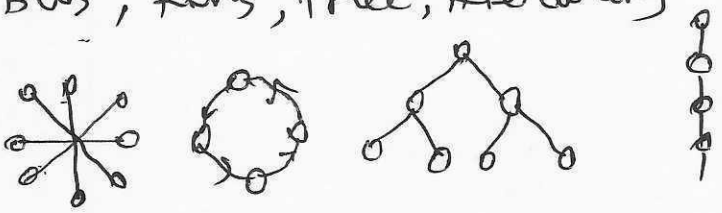
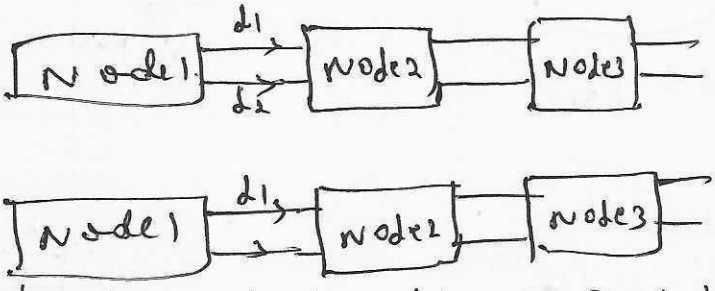
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERIN COLLEGE
DEPARTMENT OF . Electronics & Communication

SCHEME FOR VALUATION

Internal Test #3

Semester & Section: Date:

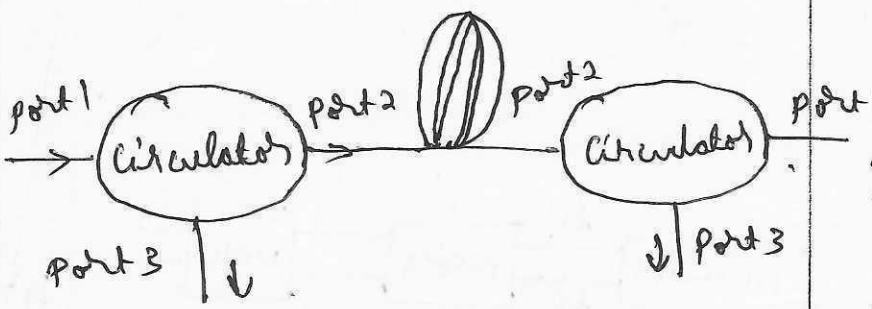
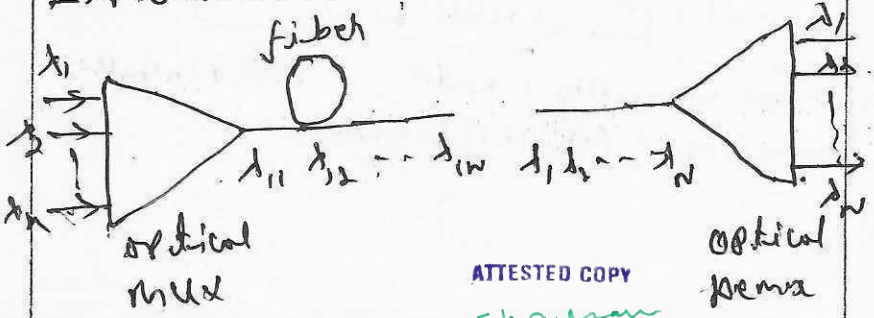
Question No.	Details of the Answer	Marks Distribution	Total Marks
6	Bus, Ring, Tree, Hierarchy  Explanation.	2½*4	10.
7.	Figure + Explanation	5+5	10.
8.	 1. fixed wavelength node 2. wavelength Convertible node + Explanation	4+2+4	10

Staff

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

HOD

Question No:	Details of the Answer	Marks Distribution	Total Marks
9.	Circuit diagram + Explanation.	5+5	
10.		3	
		4	10
	Explanation: 	3	

CITY ENGINEERING COLLEGE

Vasantapura main road,Bangalore-61

Question bank #1

1. Derive the expression for Numerical Aperture using Ray theory.
2 Explain optical fiber communication link with suitable diagram
3. (a) what are the advantages & disadvantages of optical fiber communication.

(b) A silica optical fiber with a core diameter large enough to be considered by ray theory analysis has a core refractive index of 1.5 .A light ray is incident at the core-cladding interface with a critical angle of 78.5° Estimate: (i) Refractive index of cladding (ii) Numerical aperture (iii) The acceptance angle in the air for the fiber.

4. Discuss the classification of optical fiber depending on the refractive index profile, mode of operation and material used.
5. Describe with neat diagram different types of optical fiber waveguides. Using ray theory explains the propagation of light inside the fiber.
6. Explain the index guiding photonic crystal fiber with suitable diagram.
7. Derive necessary mathematical condition that the angle of incidence 'O' must satisfy for the optical skew ray to propagate in a step index fiber.
8. Discuss what is implied by photonic crystal fiber(PCF) and explain guidance mechanism for electromagnetic modes in such optical fiber.
9. (a) In brief discuss the different design approaches for single mode fibers (b) Calculate the number of modes of an optical fiber having diameter of 50μm,η1=1.48, η2=1.46 & wavelength 'λ' of 820ηm.
10. Explain the following: (i) Modes in a planar guide (ii) Phase & group velocity.
11. Explain briefly about Graded index fibers.
12. w.r.t single mode fiber explain the following: (i) Cut off wavelength (ii) Mode field diameter (iii) Effective refractive index.
13. Explain the modes in cylindrical fiber & also write the wave equation, electric field, U,W, & V parameter.
14. Explain briefly about Photonic crystal fibers.
15. Explain briefly about fiber material used in optical fiber communication.

Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road,
Bangalore-560 061.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

Vasantapura main road,Bangalore-61

Question bank #2

1. Explain about material absorption losses in an optical fiber.
2. Explain the significance of fiber connector with relevant diagram .Explain the function of cylindrical ferrule connector.
3. Explain the fiber bend loss with relevant diagram and expression.
4. Explain intermodal dispersion with suitable diagram .show paths taken by the axial and an extreme meridional ray in a perfect multimode step index fiber.
5. Explain different absorption mechanism in optical fibers.
6. Explain linear and non-linear scattering losses in optical fibers.
7. Explain macro bending and micro bending losses with a neat diagram.
8. Explain briefly about chromatic dispersion within optical fiber.
9. Define fiber splicing .Explain electric arc fusion splicing with neat sketches.
10. A four part multi mode fiber FBT coupler has 60μW optical power launched into part 1,th,the measured output powers at port 2,3 & 4 are 0.004,26.0 and 27 μW respectively .Determine the excess loss ,insertion losses between input and output ports the cross talk and split ration for the devices.
11. Explain the different types of mechanical misalignment between the fibers.
12. What are the principles of good connector design?.
13. Explain different mechanism caused by obsorption loss.
14. What are different types of splicing & explain V-groove optical fiber splicing technique.
15. Explain the structure of double hetero structure light emitter showing energy diagram and refractive index profile.

Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road,
Bangalore-560 061.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE
VASANTAPURA ,BANGLORE-61

OPTICAL FIBER AND NETWORKS
QUESTION BANK#3

1. Explain the operational principle and implementation of WDM diagram.
2. Explain polarization independent Isolator with a neat diagram.
3. Explain the amplification mechanism in EDFA amplifier with the help of energy band diagram.
4. Explain optical Circulators and optical add drop multipliers in detail.
5. Explain the operation of Wide band amplifier representing two different band amplifier in parallel and in series.
6. Explain the operation of the thin film filters, showing two parallel light reflecting mirrored surfaces define a Fabrypersot resonator cavity.
7. Explain the principle of Raman Amplifier with stokes shift and the resulting Raman gain spectrum from a pump laser operating at 1445nm.l
8. Explain about synchronous networks with STS frame structure.
9. Explain with neat diagrams, wavelength convertible routing network architecture.
10. Write short note on optical fibre access networks and local area networks.
11. Describe about internet protocol and in evaluation over physical layer evaluation and traffic flow pattern with relevant diagram.
12. Explain optical fibre network fibre evaluation with suitable diagrams
13. Explain the principle of operation of the public telecommunications network hierarchy showing optical cross connects (oxc's) in the long haul, optical add/drop multiplier (OADMIS) in the metropolitan and an optical fibre access network.
14. Briefly, explain the basic structure of optical network and also four network terminology with diagram.
15. (a) Write basic applications and types of optical amplifiers.
    (b) Consider an EDFA being pumped at 980nm with a 30mW pump power .If the gain at 1550nm is 20dB .Find the maximum input and output power of the amplifier.

Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Kanakapura Main Road,

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Sub: Optical Fiber and Networks

Sub Code: 15EC82/17EC82

ATTENDANCE

Sl. No.	Reg. No.	Name	4/4	5/4	6/4	7/4	8/4	11/4	12/4	13/4	18/4	19/4
			1	2	3	4	5	6	7	8	9	10
1	1CE16EC20	MADAN HALAKATTI	1	2	3	4	5	6	7	8	9	10
2	1CE16EC45	T. U. SOUMYA	1	2	3	4	4	5	6	6	7	8
3	1CE17EC18	CHANDANA. R	1	2	3	4	5	6	7	8	9	10
4	1CE17EC23	DIVAKAR. S. D	1	2	3	4	5	6	7	8	9	10
5	1CE17EC25	GOVARDHAN. K. N	1	2	2	3	4	5	6	7	8	9
6	1CE17EC53	SANJAY. H	1	2	3	3	4	5	6	7	8	9
7	1CE17EC60	SHESHADRI.	1	2	3	4	5	6	7	8	9	10
8	1CE17EC61	SHYAM SUNDAR. M. G	1	2	2	3	4	5	6	7	8	9
9	1CE17EC68	TEJASWINI ANANTH JANTHLI	1	2	3	4	5	6	7	8	9	10
10	1CE17EC69	THANUSHREE R	1	2	3	4	5	6	7	8	9	10
11	1CE16EC17	KAUSHIK. A	1	2	3	3	4	5	6	7	8	9
12	1CE16EC53	SAEEDA SHAMAEL	1	2	3	4	5	6	7	7	8	9
13	1CE16EC40	AKSHAY HEGDE	1	2	2	3	4	5	6	7	8	9
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
	No. of Absents	ATTESTED COPY										
		PRINCIPAL CITY ENGINEERING COLLEGE Kanakapura Main Road, Bangalore-560061										
	Initials		R	R	R	R	R	R	R	R	R	R

ASSESSMENT

21/4	22/4	24/4	25/4	2/5	3/5	4/5	5/5	9/5	10/5
12	13	14	15	16	17	18	19	20	21
12	13	14	15	16	17	18	19	20	21
10	11	12	13	14	15	16	17	18	19
12	13	14	15	16	17	18	19	20	21
12	13	14	15	16	17	18	19	20	21
11	12	13	14	15	16	17	18	19	20
11	12	13	14	15	16	17	18	19	20
12	13	14	15	16	17	18	19	20	21
10	11	12	13	14	15	16	17	18	19
12	13	14	15	16	17	18	19	20	21
12	13	14	15	16	17	18	19	20	21
11	12	13	14	15	16	17	18	19	20
11	12	13	14	15	16	17	18	19	20
10	11	12	13	14	15	16	17	18	19
P	P	P	P	P	P	P	P	P	P

tn.	Test Marks					Sessional Marks	Remarks
	1 (50)	2 (50)	3 (50)	4 (30)	5 (10) Average		
	36	48	42	26	10	36	
	47	35	44	26	10	36	
	47	48	39	27	10	37	
	50	45	45	29	10	39	
	46	46	45	28	10	38	
	40	46	42	26	10	36	
	47	45	07	20	10	30	
	46	46	45	28	10	38	
	24	50	50	26	10	36	
	50	48	50	30	10	40	
	49	46		15	5	20	
	46	44		14	5	19	
	17	49		10	5	15	
	P	P	P	A	P	4	

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ವಿದ್ಯುನ್ಮಾನ ಮತ್ತು ಸಂವಹನ (ಶಾಖೆ / ವಿಭಾಗ)

RECORD OF CLASS WORK

Date	Period	Topics Covered
4-4-22	1	Introduction to fiber optics & Networks
5-4-22	2	Historical development, The general system.
6-4-22	3	advantages of OFC, optical fiber waveg
7-4-22	4	Ray theory transmission, modes in plane g
8-4-22	2	Phase & Group velocity, cylindrical fiber
11-4-22	2	Step index fibers
12-4-22	3	Graded index fibers
13-4-22	4	Single mode fiber, cut off wavelength.
18-4-22	1	mode field, effective refractive index
19-4-22	2	fiber materials, photonic crystal fibers
20-4-22	3	fiber optic Cables, Speciality fibers
21-4-22	4	Attenuation, material absorption losses
22-4-22	3	Linear & non-linear Scattering losses
25-4-22	4	Fiber bend loss
26-4-22	2	dispersion, Chromatic dispersion
2-5-22	3	Intermodal dispersion
3-5-22	1	multimode fiber alignment & joint loss
4-5-22	2	Fibers splices
5-5-22	3	Fiber connectors
9-5-22	4	Energy Bands, direct & indirect bands
10-5-22	4	LED - Structure
11-5-22	2	Quantum Efficiency & LED Power
12-5-22	3	modulation, laser diode
17-5-22	4	Radiation Pattern

Ramakrishna.S
Teacher's Signature

ATTESTED COPY
skarman
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

HOD'S Signature

RECORD OF CLASS WORK

Date	Period	Topics Covered
18 -5-22	2	Physical Principles of Photo diodes
19 -5-22	2	Photo detector noise.
23 -5-22	3	Detector response. Optical Receiver.
24 -5-22	4	Problems
31-5-22	1	Optical network terminology
6 -6-22	2	Optical network node & switching elements
7 -6-22	3	WDM network
8 -6-22	4	Public telecommunication N/Ws
15 -6-22	2	Optical N/W modes
20 -6-22	3	Synchronous network
21 -6-22	4	Optical transport networks
27 -6-22	2	Optical burst switching N/Ws
28 -6-22	3	MAN, LAN.

Ravindra S.
Teacher's Signature

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

HOD'S Signature

CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CIRCULAR

Ref. No: CEC/ECE/DAC/2021-2022/01 **Date: 02-08-2021**

All the members of Department Advisory Committee are informed to attend a meeting which will be held as follows

Date: 04-08-2021
Time: 03.30 PM
Venue: **LAB A206**

Agenda:

- Discussion on New Education Policy (NEP 2020)
- Conducting Add-on Course and soft skill training
- Faculty development programme
- Conducting coding, debugging events

Prof. Mallikarjuna G S

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Department Advisory Committee Meeting

Date: 04-08-2021
Time: 03.30 PM
Venue: LAB A206

DAC Members Present:

Sl. No	Member Name	Designation	Role	Signature
1	Prof. Mallikarjuna G S	HOD	Convenor	
2	Dr. Shalini Prasad	Professor	Co-Convenor	
3	Prof. Shylaja K	Assistant Professor	Member	
4	Prof. Ravindra S	Assistant Professor	Member	
5	Prof. Aurobindo Koti	Assistant Professor	Member	Koti
6	Prof. SKL Narayana	Assistant Professor	Member	

The Department Advisory Committee meeting was conducted at Department of ECE, on 04th August 2021, at 03:30 PM.

Agenda of the Meeting:

- Discussion on New Education Policy (NEP 2020)
- Conducting Add-on Course and soft skill training
- Faculty development programme
- Conducting coding, debugging events

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

Minutes of Meeting:

In the Department Advisory Committee meeting, an overview of the department was presented, emphasizing student achievements, result analysis, and faculty accomplishments. The members discussed various suggestions for improvement and reviewed the meeting agenda.

The Committee proposed the following items for inclusion in the agenda:

- The HOD briefed the team about the new education policy, emphasizing the importance of faculty awareness regarding upcoming government initiatives under the NEP. Consequently, it was decided to organize a Faculty Development Program focused on the new education policy.
- A recommendation was made to introduce a certificate course in **Python using Arduino**, which aims to not only enhance students' programming skills but also deepen their understanding of this advanced subject. Additionally, the need for soft skills development was discussed.
- The HOD also proposed a **3-day PCB design event** to further engage students in practical learning.

Prof. Mallikarjuna G S

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

ACADEMIC YEAR:2021-22 (odd)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE PREFERENCE

Name of the Faculty: Dr. Shalini. Prasad

Designation: Associate Professor.

Sl. No	Course Code and Name	Year/Semester
1	18EC35 - computer organization & architecture	III / 3rd
2	17ECL76 - Advance comm lab	IV / 7th
3	18EC52 - Digital signal processing	III / 5th
4	17EC72 - Digital Image processing	IV / 7th
5	18EC53 - Principle of communication system	III / 5th

S. Prasad.

Signature of Faculty

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

Department of Electronics and Communication Engineering

COURSE ALLOCATION ACY:2021-22 (Odd)

Sl.No	Name of the Faculty	Course code and Name	Year& Semester	Signature
1	Prof. Mallikarjuna	18EC32 – Network Theory	2021 III rd	
2	Prof. Shylaja K	18EC33 - Electronic Devices 18ECL37- Electronic Devices & Instrumentation lab	2021 - III 2021 - III	
3	Prof. Shalini prasad	18EC35 – Computer Organisation & Architecture 17ECL76 - Advance Communication lab	2021 - III 2021 - VII	
4	Prof. Ravindra .S.	18EC55 - Electro Magnetic waves 18ECL57- DSP Lab 18ECP78/17ECP78 – Project work P1	2021 - V 2021 - V 2021 - VII	
5	Prof. VishwaKiran	18EC34 - Digital System Design 18CS752- Phyton Application Programming	2021 - III 2021 - VII	
6	Prof. GopiKishan J	18EC36 - Power Electronics & Instrumentation 17EC73 – Power Electronics 15EC73 – Power Electronics	2021 - III 2021 - VII 2021 - VII	
7	Prof. Deepa Mathew K	18EC52 - Digital Signal processing 17EC72 - Digital Image processing 15EC72 - Digital Image processing	2021 - V 2021 - VII 2021 - VII	
8	Prof. Krishna. K.S.	18EC54 - Information Theory & Coding 18ECL38- DSD Lab	2021 - V 2021 - III	
9	Prof. SKL Narayana	18EC56- Verilog HDL 17EC71 – Microwave & Antenna 15EC71 - Microwave & Antenna	2021 - V 2021 - VII 2021 - VII	
10	Prof. Madhavi J Kulkarni	18EC53- Principle of Communication System 17EC755 – Satellite Communication	2021 - V 2021 - VII	

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE

11	Prof. Sravanthi R	18EC731 - Real Time Systems 17EC743 - Real Time Systems 15EC743 - Real Time Systems	2021-VII 2021-VII 2021-VII	Sravan Rani
12	Prof. Radhika	18EC72 - VLSI DESIGN 18ECL58 - HDL Lab	2021-VII 2021-V	Radhika.
13	Prof. Ranganath .S.L	18EC71 - Computer Network 18ECL76 - CN Lab	2021-VII 2021-VII	Ranga
14	Prof. Sheethal	18EC741 - IOT & Wireless Sensor Network 18ECL77 - VLSI Lab	2021-VII 2021-VII	Sheethal P.

HOD, ECE

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

VISION

Making Remarkable Contribution by Disseminating Knowledge on Emerging Trends in Engineering and Technology through various Programmes, Innovation and Research so as to Excel in Quality both at National and International level and to provide Career Guidance & Training for Employment.

MISSION

M1- To encourage Knowledge Acquisition and Foster Innovation & Research.

M2- To Prepare Students for Immediate Employment, leading to Technological and Socio- economical growth.

M3- To Provide Guidance for a Productive Career under various programmes.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

PROGRAM OUTCOMES (PO)

PO1 – Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 – Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 – Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 – Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 – Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6 – The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7 – Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8 – Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9 – Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 – Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 – Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12 – Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcome

Electronics & Communication Engineering: Analyze and Design analog & digital circuits or systems. Implement functional blocks of hardware-software co-designs for signal processing and communication applications.

Work with respect for societal values and concern for environment in implementing engineering solutions.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Academic Calendar for ODD Semester of UG programmes for year 2021-22

	V semester B.E./B.Tech.	V semester B.Arch./ B.Plan.	VII semester B.E./B.Tech.	VII semester B.Plan./B.Arch	IX semester B.Arch	III semester B.E./ B.Tech.	III Semester B.Arch.	III semester B. Plan	I semester B.E./B.Tech.	I semester B.Arch/B.Plan
Commencement of ODD Semester	01.10.2021	01.10.2021	01.10.2021	01.10.2021	01.10.2021	18.10.2021	18.10.2021	18.10.2021	Will be announced later	
Last Working day of ODD Semester	31.01.2022	31.01.2022	31.01.2022	31.01.2022	31.01.2022	19.02.2022	19.02.2022	19.02.2022		
Practical Examination	01.02.2022 To 10.02.2022	01.02.2022 To 10.02.2022	01.02.2022 To 10.02.2022	01.02.2022 To 10.02.2022	---	21.02.2022 To 04.03.2022	21.02.2022 To 04.03.2022	21.02.2022 To 04.03.2022		
Theory Examinations	11.02.2022 To 25.03.2022	11.02.2022 To 25.03.2022	11.02.2022 To 25.03.2022	11.02.2022 To 25.03.2022	---	07.03.2022 To 25.03.2022	07.03.2022 To 25.03.2022	07.03.2022 To 25.03.2022		
Internship	---	---	---	---	---	---	---	---		
Internship Viva Voce/ Project viva	---	---	---	---	---	---	---	---		
Summer Project / Professional training / Organization Study	---	---	---	---	---	---	---	---		
Submission of the report to University	---	---	---	---	---	---	---	---		
Commencement of EVEN Semester	04.04.2022	04.04.2022	04.04.2022	04.04.2022`	07.02.2022	11.04.2022	11.04.2022	11.04.2022		

Please Note:

- The academic sessions for ODD semesters should commence from the **dates mentioned** above.
- The Institute needs to function for **six days** a week with additional hours (**Saturday is a full working day).** #if required the college can plan to have extra classes even on Sundays also.
- Faculty should conduction additional tutorial classes ONLINE to solve the doubts of the students.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by MHRD/UGC/AICTE/State Government.
- Academic Calendar is also applicable for **Autonomous Colleges.** In case if any changes are to be effected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.
- The offline classes may be conducted either by **staggering** the timings in 02 sessions in a day with 50% capacity for each session or full day session with 50% capacity on alternative days, following all SOPs.
- The college has to conduct offline classes to cover **80%** of the syllabus of the courses; however, **20%** of the syllabus can be covered in virtual (Online) mode. **Attendance of the students'** for offline and online classes is mandatory and record should be maintained and submitted to university whenever informed.
- Students joining to VII semester B.E./B.Tech., should complete the **Internship** before the commencement of the classes.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

REGISTRAR

CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2021-22 (ODD SEM).

DAY	Date	OCTOBER	Date	NOVEMBER	Date	DECEMBER	Date	JANUARY	Date	FEBRUARY	Date	MARCH
FRI	1	STARTING OF 5th & 7th Semesters										
SAT	2	GANDHI JAYANTI(DH)					1					
SUN	3						2			VTU PracticalExams 01.02.2022 To 10.02.2022 5th & 7th Semesters		
MON	4		1	KANNADA RAJYOTSAVA(DH)			3					
TUE	5		2				4		1		1	
WED	6	MAHALAYA AMAVASYA(DH)	3	NARAKA CHATURDASHI(DH)	1		5		2		2	
THU	7		4		2		6		3		3	
FRI	8		5	DEEPAVALI(DH)	3		7		4		4	
SAT	9	2ND SAT HOLIDAY	6		4		8	2ND SAT HOLIDAY	5		5	
SUN	10		7		5		9		6		6	
MON	11		8	FIRST INTERNAL ASSESSMENT 5th & 7th Semesters	6	SECOND INTERNAL ASSESSMENT 5th & 7th Semesters	10		7		7	
TUE	12		9		7		11		8		8	
WED	13		10		8		12		9	SECOND INTERNAL ASSESSMENT 3rd Semester17,18,19	9	
THU	14	AYUDHA PUJA(DH)	11		9		13		10		10	THIRD INTERNAL ASSESSMENT For 3rd sem 17,18,19
FRI	15	VIJAYA DASHAMI(DH)	12		10		14		11		11	
SAT	16		13	2ND SATURDAY HOLIDAY	11	2ND SAT HOLIDAY	15		12		12	
SUN	17		14		12		16		13		13	
MON	18	STARTING OF 3rd Semester	15		13	STARTING OF1st Semester	17		14	VTU Theory Exams for 5th & 7th Semesters 11.02.2022 To 25.03.2022	14	
TUE	19	Id Meelad(DH)	16		14		18		15		15	Lab internals for 3RD 7Sem 21ST TO 24TH
WED	20	VALMIKI JAYANTHI(DH)	17		15		19		16		16	Last Working day of 3rdSemester 25.03.2022
THU	21		18		16		20		17		17	VTU Practical Exams For 3rd sem REGULAR 28.03.2022 To 31.03.2022
FRI	22		19		17		21		18	Last Working day of 1st Semester30.03.2022	18	
SAT	23	4TH SATURDAY HOLIDAY	20	ALUMNI MEET & GRADUATION DAY	18		22	4TH SATURDAY HOLIDAY	19	Practical Exams For 1st sem 01.04.2022 To 08.04.2022 Theory Exams for 1st sem 11.04.2022 To 23.04.2022	19	VTU Practical Exams For 3rd sem LATERAL 21.04.2022 To 26.04.2022 Theory Exams for 3rd sem 01.04.2022 To 20.04.2022
SUN	24		21		19		23		20		20	
MON	25		22	KANAKA JAYANTHI(DH)	20		24	THIRD INTERNAL ASSESSMENT 5th & 7th Semesters Lab internals for 5th & 7th Sem	21	Commencement of EVEN Semester for 6th,8thsem4.04.2022 4th sem -02.05.2022 2ndsem-6.05.2022	21	
TUE	26		23		21		25		22		22	
WED	27		24		22		26		23		23	
THU	28		25		23		27		24		24	
FRI	29		26		24		28		25		25	
SAT	30		27	4TH SATURDAY HOLIDAY	25	4TH SATURDAY HOLIDAY	29		26		26	
SUN	31		28	FIRST INTERNAL ASSESSMENT 3rd Semester	26		30		27		27	
MON			29		27		31	Last Working day of 5th & 7th Sem	28		28	

Principal
City Engineering College,
Bangalore-560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2021-22 (ODD SEM).

DEPT OF E&CE

DAY	Date	OCTOBER	Date	NOVEMBER	Date	DECEMBER	Date	JANUARY	Date	FEBRUARY	Date	MARCH
FRI	1	STARTING OF 5th & 7th Semesters										
SAT	2	GANDHI JAYANTI(DH)					1					
SUN	3						2			VTU PracticalExams 01.02.2022 To 10.02.2022 5th & 7th Semesters		
MON	4		1	KANNADA RAJYOTSAVA(DH)			3					
TUE	5		2				4		1		1	
WED	6	MAHALAYA AMAVASYA(DH)	3	NARAKA CHATURDASHI(DH)	1		5		2		2	
THU	7		4		2		6	GUEST LECTURE 2	3		3	
FRI	8		5	DEEPAVALI(DH)	3		7		4		4	
SAT	9	2ND SAT HOLIDAY	6		4		8	2ND SAT HOLIDAY	5		5	
SUN	10		7		5		9		6		6	
MON	11	PCB WORKSHOP	8	FIRST INTERNAL ASSESSMENT 5th & 7th Semesters	6	SECOND INTERNAL ASSESSMENT 5th & 7th Semesters	10		7		7	
TUE	12		9		7		11		8		8	
WED	13		10		8		12		9	SECOND INTERNAL ASSESSMENT 3rd Semester17,18,19	9	
THU	14	AYUDHA PUJA(DH)	11		9		13		10		10	THIRD INTERNAL ASSESSMENT For 3rd sem 17,18,19
FRI	15	VIJAYA DASHAMI(DH)	12		10		14		11		11	
SAT	16		13	2ND SATURDAY HOLIDAY	11	2ND SAT HOLIDAY	15		12		12	
SUN	17		14		12		16		13		13	
MON	18	STARTING OF 3rd Semester	15		13	STARTING OF1st Semester	17		14	VTU Theory Exams for 5th & 7th Semesters 11.02.2022 To 25.03.2022	14	
TUE	19	Id Meelad(DH)	16		14		18		15		15	Lab internals for 3RD 7Sem 21ST TO 24TH
WED	20	VALMIKI JAYANTHI(DH)	17		15	INDUSTRIAL VISIT	19		16		16	
THU	21		18		16		20		17		17	Last Working day of 3rdSemester 25.03.2022
FRI	22		19		17		21		18	Last Working day of 1st Semester30.03.2022	18	VTU Practical Exams For 3rd sem REGULAR 28.03.2022 To 31.03.2022
SAT	23	4TH SATURDAY HOLIDAY	20	ALUMNI MEET & GRADUATION DAY	18		22	4TH SATURDAY HOLIDAY	19	Practical Exams For 1st sem 01.04.2022 To 08.04.2022 Theory Exams for 1st sem 11.04.2022 To 23.04.2022	19	
SUN	24		21		19		23		20		20	
MON	25		22	KANAKA JAYANTHI(DH)	20		24	THIRD INTERNAL ASSESSMENT 5th & 7th Semesters	21		21	VTU Practical Exams For 3rd sem LATERAL 21.04.2022 To 26.04.2022
TUE	26		23		21		25		22		22	
WED	27	GUEST LECTURE 1	24		22		26		23	Commencement of EVEN Semester for 6th,8thsem4.04.2022 4th sem -02.05.2022 2ndsem-6.05.2022	23	Theory Exams for 3rd sem 01.04.2022 To 20.04.2022
THU	28		25		23		27	Lab internals for 5th & 7th Sem	24		24	
FRI	29		26		24		28		25		25	
SAT	30		27	4TH SATURDAY HOLIDAY	25	4TH SATURDAY HOLIDAY	29		26		26	
SUN	31		28	FIRST INTERNAL ASSESSMENT 3rd Semester	26		30		27		27	
MON			29		27		31	Last Working day of 5th & 7th Sem	28		28	

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Principal
City Engineering College
Bangalore-560 061

CITY ENGINEERING COLLEGE

Off Kanakapura Road, Doddakallasandra, Bangalore – 61

ACADEMIC FILE

Name	RAVINDRA.S
Designation	ASSISTANT PROFESSOR
Semester	FIFTH (5th)
Section	A
Subject Name/Code	ELECTROMAGNETIC WAVES (18EC55)
Academic Year	2021-22

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE			
DEPT. OF ELECTRONICS & COMMUNICATION ENGINEERING			
ODD 2021-22	5TH SEM EC	STUDENT LIST	
SL.NO.	SCHEME	USN	NAME
1	2018	1CE19EC001	ANIL K
2	2018	1CE19EC002	APOORVA. KULKARNI
3	2018	1CE19EC003	CHARAN YADAV B
4	2018	1CE19EC005	MADHUSHREE M
5	2018	1CE19EC006	MEENA J
6	2018	1CE19EC007	PRAVEEN K
7	2018	1CE19EC008	ROHANA H
8	2018	1CE19EC009	SUPRIYA G
9	2018	1CE19EC010	VISHWAS D V

Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road,
Bengaluru-560 061.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD 2021-2022 TIME TABLE

Wef: 01 OCT 2021

SEMESTER: V EC CBCS | 2018 SCHEME | CLASS ROOM:A106

DAY	1 9:15 AM 10.10 AM	2 10:10AM 11:05 AM	TEA 11:05 AM 11:20 AM	3 11:20 AM 12:15 PM	4 12:15 PM 1:10 PM	LUNCH 1:10 PM 2:00 PM	5 2:00 PM 2:50 PM	6 2:50 PM 3:40 PM	7 3:40 PM 4:30 PM
MON	*18EC54*	*18EC53*		*18EC52*	*18EC56*		*Tutorial*		
TUE	*18EC51*	*18EC51*	*BREAK*	*18EC55*	*18EC56*	*LUNCH*	*Tutorial*		
WED	*18EC55*	*18EC53*		*18EC54*	*18EC52*		*18ECL58* ---------- *A1*		
THU	*18EC56*	*18ES56*		*18EC51*	*18EC55*		*18ECL57* ---------- *A1*		
FRI	*18EC52*	*18EC52*		*18EC53*	*18EC54*		*Tutorial*		
SAT	*18ES55*	*18EC53*		*18EC51*	*18EC54*				

SUBJECT CODE	SUBJECT NAME		SUBJECT HANDELED
18ES51	Technological Innovation Management And Entrepreneurship		Prof. Shylaja K
18EC52	Digital Signal Processing		Prof. Deepa Mathew K
18EC53	Principles of Communication Systems		Dr. Shalini Prasad
18EC54	Information Theory & Coding		Prof. Gopi Kishan J
18EC55	Electromagnetic Waves		Prof. Ravindra S
18EC56	Verilog HDL		Prof. Vishva Kiran RC
18ECL57	Digital Signal Processing Laboratory	A1	Prof. Deepa Mathew K, Prof. Ravindra S
18ECL58	HDL Laboratory	A1	Prof. Vishva Kiran RC, Prof. Gopi Kishan J
18CIV59	Environmental Studies		

TIMETABLE Co-ordinator

HOD, Dept. of E&CE

Principal
City Engineering College,
Bangalore-560 061

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2021-22 (ODD SEM).

DAY	Date	OCTOBER	Date	NOVEMBER	Date	DECEMBER	Date	JANUARY	Date	FEBRUARY	Date	MARCH
FRI	1	STARTING OF 5th & 7th Semesters										
SAT	2	GANDHI JAYANTI(DH)					1					
SUN	3						2			VTU PracticalExams 01.02.2022 To 10.02.2022 5th & 7th Semesters		
MON	4		1	KANNADA RAJYOTSAVA(DH)			3					
TUE	5		2				4		1		1	
WED	6	MAHALAYA AMAVASYA(DH)	3	NARAKA CHATURDASHI(DH)	1		5		2		2	
THU	7		4		2		6		3		3	
FRI	8		5	DEEPAVALI(DH)	3		7		4		4	
SAT	9	2ND SAT HOLIDAY	6		4		8	2ND SAT HOLIDAY	5		5	
SUN	10		7		5		9		6		6	
MON	11		8	FIRST INTERNAL ASSESSMENT 5th & 7th Semesters	6	SECOND INTERNAL ASSESSMENT 5th & 7th Semesters	10		7		7	
TUE	12		9		7		11		8		8	
WED	13		10		8		12		9	SECOND INTERNAL ASSESSMENT 3rd Semester17,18,19	9	
THU	14	AYUDHA PUJA(DH)	11		9		13		10		10	THIRD INTERNAL ASSESSMENT For 3rd sem 17,18,19
FRI	15	VIJAYA DASHAMI(DH)	12		10		14		11		11	
SAT	16		13	2ND SATURDAY HOLIDAY	11	2ND SAT HOLIDAY	15		12		12	
SUN	17		14		12		16		13		13	
MON	18	STARTING OF 3rd Semester	15		13	STARTING OF1st Semester	17		14	VTU Theory Exams for 5th & 7th Semesters 11.02.2022 To 25.03.2022	14	
TUE	19	Id Meelad(DH)	16		14		18		15		15	Lab internals for 3RD 7Sem 21ST TO 24TH
WED	20	VALMIKI JAYANTHI(DH)	17		15		19		16		16	
THU	21		18		16		20		17		17	Last Working day of 3rdSemester 25.03.2022
FRI	22		19		17		21		18	Last Working day of 1st Semester30.03.2022	18	VTU Practical Exams For 3rd sem REGULAR 28.03.2022 To 31.03.2022 VTU Practical Exams For 3rd sem LATERAL 21.04.2022 To 26.04.2022 Theory Exams for 3rd sem 01.04.2022 To 20.04.2022
SAT	23	4TH SATURDAY HOLIDAY	20	ALUMNI MEET & GRADUATION DAY	18		22	4TH SATURDAY HOLIDAY	19	Practical Exams For 1st sem 01.04.2022 To 08.04.2022 Theory Exams for 1st sem 11.04.2022 To 23.04.2022 Commencement of EVEN Semester for 6th,8thsem4.04.2022 4th sem -02.05.2022 2ndsem-6.05.2022	19	
SUN	24		21		19		23		20		20	
MON	25		22	KANAKA JAYANTHI(DH)	20		24	THIRD INTERNAL ASSESSMENT 5th & 7th Semesters Lab internals for 5th & 7th Sem	21		21	
TUE	26		23		21		25		22		22	
WED	27		24		22		26		23		23	
THU	28		25		23		27		24		24	
FRI	29		26		24		28		25		25	
SAT	30	ATTESTED COPY	27	4TH SATURDAY HOLIDAY	25	4TH SATURDAY HOLIDAY	29		26		26	
SUN	31		28	FIRST INTERNAL ASSESSMENT 3rd Semester	26		30		27		27	
MON			29		27		31	Last Working day of 5th & 7th Sem	28		28	

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Principal
City Engineering College,
Bangalore-560 061

B. E. (EC / TC)
Choice Based Credit System (CBCS) and Outcome Based Education (OBE)
SEMESTER – V

Subject Code	18EC55	CIE Marks	40
Number of Lecture Hours/Week	03	SEE Marks	60
Total Number of Lecture	40 (8 Hours per Module)	Exam Hours	03
CREDITS – 03			

Course Learning Objectives: This course will enable students to:

- Study the different coordinate systems, Physical significance of Divergence, Curl and Gradient.
- Understand the applications of Coulomb's law and Gauss law to different charge distributions and the applications of Laplace's and Poisson's Equations to solve real time problems on capacitance of different charge distributions.
- Understand the physical significance of Biot-Savart's, Amperes's Law and Stokes'theorem for different current distributions.
- Infer the effects of magnetic forces, materials and inductance.
- Know the physical interpretation of Maxwell'equations and applications for Plane waves for their behaviour in different media.
- Acquire knowledge of Poynting theorem and its application of power flow.

Module-1

Revision of Vector Calculus – **(Text 1: Chapter 1)**
Coulomb's Law, Electric Field Intensity and Flux density: Experimental law of Coulomb, Electric field intensity, Field due to continuous volume charge distribution, Field of a line charge, Field due to Sheet of charge, Electric flux density, Numerical Problems. **(Text: Chapter 2.1 to 2.5, 3.1)**

Module-2

Gauss's law and Divergence: Gauss 'law, Application of Gauss' law to point charge, line charge, Surface charge and volume charge, Point (differential) form of Gauss law, Divergence. Maxwell's First equation (Electrostatics), Vector Operator ▼ and divergence theorem, Numerical Problems **(Text: Chapter 3.2 to 3.7).**
Energy, Potential and Conductors: Energy expended or work done in moving a point charge in an electric field, The line integral, Definition of potential difference and potential, The potential field of point charge, Potential gradient, Numerical Problems **(Text: Chapter 4.1 to 4.4 and 4.6).**Current and Current density, Continuity of current. **(Text: Chapter 5.1, 5.2)**

Module-3

Poisson's and Laplace's Equations: Derivation of Poisson's and Laplace's Equations, Uniqueness theorem, Examples of the solution of Laplace's equation, Numerical problems on Laplace equation **(Text: Chapter 7.1 to 7.3)**
Steady Magnetic Field: Biot-Savart Law, Ampere's circuital law, Curl, Stokes' theorem, Magnetic flux and magnetic flux density, Basic concepts Scalar and Vector Magnetic Potentials, Numerical problems. **(Text: Chapter 8.1 to 8.6)**

Module-4

Magnetic Forces: Force on a moving charge, differential current elements, Force between differential current elements, Numerical problems **(Text: Chapter 9.1 to 9.3).**
Magnetic Materials: Magnetization and permeability, Magnetic boundary conditions, The magnetic circuit, Potential energy and forces on magnetic materials, Inductance and mutual reactance, Numerical problems **(Text: Chapter 9.6 to 9.7).**

Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road,
Bengaluru-560 061.

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Faraday' law of Electromagnetic Induction –Integral form and Point form, Numerical problems **(Text: Chapter 10.1)**

Module-5

Maxwell's equations Continuity equation, Inconsistency of Ampere's law with continuity equation, displacement current, Conduction current, Derivation of Maxwell's equations in point form, and integral form, Maxwell's equations for different media, Numerical problems **(Text: Chapter 10.2 to 10.4)**

Uniform Plane Wave: Plane wave, Uniform plane wave, Derivation of plane wave equations from Maxwell's equations, Solution of wave equation for perfect dielectric, Relation between E and H, Wave propagation in free space, Solution of wave equation for sinusoidal excitation, wave propagation in any conducting media (**γ, α, β, η**) and good conductors, Skin effect or Depth of penetration, Poynting's theorem and wave power, Numerical problems. **(Text: Chapter 12.1 to 12.4)**

Course Outcomes: After studying this course, students will be able to:

- Evaluate problems on electrostatic force, electric field due to point, linear, volume charges by applying conventional methods and charge in a volume.
- Apply Gauss law to evaluate Electric fields due to different charge distributions and Volume Charge distribution by using Divergence Theorem.
- Determine potential and energy with respect to point charge and capacitance using Laplace equation and Apply Biot-Savart's and Ampere's laws for evaluating Magnetic field for different current configurations
- Calculate magnetic force, potential energy and Magnetization with respect to magnetic materials and voltage induced in electric circuits.
- Apply Maxwell's equations for time varying fields, EM waves in free space and conductors and Evaluate power associated with EM waves using Poynting theorem.

Text Book:

W.H. Hayt and J.A. Buck, –Engineering Electromagnetics‖, 8th Edition, Tata McGraw- Hill, 2014, ISBN-978-93-392-0327-6.

Reference Books:

1. **Elements of Electromagnetics** – Matthew N.O., Sadiku, Oxford university press, 4thEdn.
2. **Electromagnetic Waves and Radiating systems** – E. C. Jordan and K.G. Balman, PHI, 2ndEdn.
3. **Electromagnetics**- Joseph Edminister, Schaum Outline Series, McGraw Hill.
N. NarayanaRao, –Fundamentals of Electromagnetics for Engineering‖, Pearson.

Professor & Head
Dept. of Electronics &
Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road,
Bangalore-560 061.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGNEERING COLLEGE

Doddakalsandra, Off kanakapura road, Bangalore 560 061.

Course Title: Electromagnetic Waves	Course Code : 18EC55
Total contact hours: 40(8 hrs per module)	End Term Marks : 60
Internal Marks : 40	Credits : 03
Semester : V	Academic year : 2021-22
Lesson plan Author: Ravindra.S	Date :01/10/2021

Course Objective:

This course will enable students to:

- Define and Describe Coulomb's law and electric field intensity.
- Define and explain electric flux density, Gauss's law and divergence.
- Describe energy and potential along with concepts of current and conductors.
- Describe Poisson's and Laplace's Equations, and Uniqueness Theorem.
- Define and Describe basic concepts of Magneto statics by studying the various laws,
- Stoke's Theorem and scalar and vector magnetic flux density.
- Explain Magnetic Forces, Materials and Inductance.
- Describe the concepts of time varying fields and Develop Maxwell's equations in Point and Integral Forms.
- Describe and Compare different Types of Wave Propagation.

Course Outcomes:

After studying this course, students will be able to:

- Acquire knowledge and solve problems related to Basic Concepts of Electric Fields, Magnetic Fields and Electromagnetic Waves.
- Basic Concepts to Solve Complex Problems in Electric Fields, Magnetic Fields and Electromagnetic Waves.
- Time-varying fields and Maxwell's equations. Wave propagation in free space and dielectrics.
- Analyze Different Charge and Current Configurations to derive Electromagnetic Field Equations.
- Poisson's and Laplace's Equations, Uniqueness theorem, and solution of Laplace's equation.
- Time-varying fields, Maxwell's equations, wave propagation in free space and dielectrics.
- Interpretation of Gradient, Divergence and Curl Operators.
- Maxwell's Equations in differential and integral forms.
- Wave propagation in free space and dielectrics.

Professor & Head
Dept. of Electronics & Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road,
Bengaluru-560 061.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Name of the Faculty: Ravindra.S LESSON PLAN ACADEMIC YEAR: 2021-22

Week	Days	Module	Main Topics	Sub Topics	Bloom's Taxonomy Level(L)	Course Outcome (CO)
1	1	I	Coulomb's law	Introduction to vector algebra	L1,L2	CO-1
	2			Coordinate system	L1,L2	CO-1
	3			Experimental law of coulomb	L1,L2	CO-1
	4			Electric field intensity	L1,L2	CO-1
	5			problems	L1,L2	CO-1
	6			Problems	L1,L2	CO-1
	7			Assignment-1	L1,L2	CO-1
2	1		Electric field intensity	Field due to a continuous volume charge distribution	L1,L2	CO-2
	2			Field of a line charge :derivation	L1,L2	CO-2
	3			Field of a sheet charge:derivation	L1,L2	CO-2
	4			Problems	L1,L2	CO-2
	5			Problems	L1,L2	CO-2
	6			Classtest-1	L1,L2	CO-2
3	1		Flux density	Electric flux density	L1,L2	CO-2
	2			derivations	L1,L2	CO-2
	3			Problems	L1,L2	CO-2
	4			Problems	L1,L2	CO-2
	5			Problems	L1,L2	CO-2
	6			Assignment-2	L1,L2	CO-2
4	1	II	Gauss's law and divergence	Concept of Gauss's law	L1,L2	CO-3
	2			Divergence	L1,L2	CO-3
	3			Maxwell's first equation	L1,L2	CO-3
	4			Vector operator	L1,L2	CO-3

Professor & Head
Dept. of Electronics & Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road
Bengaluru-560 061

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

5	1			Divergence theorem	L1,L2	CO-3
	2			Problems	L1,L2	CO-3
	3			Classtest-2	L1,L2	CO-3
6	1	II	Energy ,potential and conductors	Derivation	L1,L2	CO-3
	2			Problems	L1,L2	CO-3
	3			Problems	L1,L2	CO-3
	4			Energy expended in moving a point charge in an electric field	L1,L2	CO-3
	5			Derivation	L1,L2	CO-3
	6			Problems	L1,L2	CO-3
	7			Assignment-3	L1,L2	CO-3
7	1			The line integral	L1,L2	CO-3
	2			Definition of potential difference and potential	L1,L2	CO-3
	3			The potential field of point charge.	L1,L2	CO-3
	4			Current and Current density	L1,L2	CO-3
	5			problems	L1,L2	CO-3
	6			Classtest-3	L1,L2	C0-3
8	1			Continuity of current	L1,L2	CO-3
	2			derivations	L1,L2	CO-4
	3			Derivations	L1,L2	CO-4
	4			Problems	L1,L2	CO-4
	5			Problems	L1,L2	CO-4
	6			Assignment- 4	L1,L2	CO-4
9	1	III	Poisson's and laplace's equation	Derivation of Poisson's and Laplace's Equations	L1,L2	CO2, CO4
	2			Applications	L1,L2	CO2, CO4

Professor & Head
Dept. of Electronics & Communication Engineering
City Engineering College,
Doddakallasandra, Kanakapura Main Road,
Bangalore-560 062

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

	3			Uniques theorem	L1,L2	CO2, CO4
	4			Examples of the solution of Laplace's equation	L1,L2	CO2, CO4
9	1			Problems	L1,L2	CO2, CO4
	2			Problems	L1,L2	CO2, CO4
	3			Classtest-4	L1,L2	CO2, CO4
10	1	III	Steady magnetic field	BiotSavart's Law , ampere's circuital law	L1,L2	CO4
	2			Curl, stoke's theorem	L1,L2	CO4
	3			Magnetic flux and magnetic flux density	L1,L2	CO4
	4			scalar and magnetic potential s	L1,L2	CO4
11	1			derivations	L1,L2	CO4
	2			Derivations	L1,L2	CO4
	3			Problems	L1,L2	CO4
	4			Derivations	L1,L2	CO4
	5			problems	L1,L2	CO4
	6			problems	L1,L2	CO4
	7			Assignment-5	L1,L2	CO4
12	1	IV	Magnetic forces	Force on a moving charge	L1,L2	CO4
	2			Differential current elements	L1,L2	CO4
	3			Force between differential current elements	L1,L2	CO4
	4			problems	L1,L2	CO4
	5			Derivations	L1,L2	CO4
12	1			problems		CO4
	2			Classtest-5	L1,L2	CO4
13	1	IV	Magnetic	Magnetisation and permeability	L1,L2	CO4

Professor & Head
Dept. of Electronics & Communication Engineering
City Engineering College

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

	2		materials	Magnetic boundary condition	L1,L2	CO4
	3			Magnetic circuit	L1,L2	CO4
	4			Potential energy and forces on magnetic materials	L1,L2	CO4
	5			Derivations	L1,L2	CO4
	6			problems	L1,L2	CO4
	7			Assignment-6	L1,L2	CO4
14	1	V	Time varying fields and maxwell's equations	Faraday's law	L1,L2,L3,	CO1,C04
	2			Displacement current	L1,L2,L3	CO1,C04
	3			Maxwell's equations in point form	L1,L2,L3	CO1,C04
	4			Maxwell's equations in integral form	L1,L2,L3	CO1,C04
	5			problems	L1,L2,L3	CO1,C04
15	1		Uniform plane wave	Wave propagation in free space	L1,L2,L3	CO1,C04
	2			Wave propagation in good conductors	L1,L2,L3	CO1,C04
16	1			Poynting's theorem	L1,L2,L3	CO1,C04
	2			Wave power	L1,L2,L3	CO1,C04
	3			Derivations	L1,L2,L3	CO1,C04
	4			Derivations	L1,L2,L3	CO1,C04
	5			problems	L1,L2,L3	CO1,C04
	6			Classtest-6	L1,L2,L3	CO1,C04

Bloom's Taxonomy Level (L)

L1-Remembering L2-Understanding L3-Applying L4-Analysing L5-Evaluating L6-Creating

Text Books:

1. W.H. Hayt and J.A. Buck, "Engineering Electromagnetics", 7th Edition, Tata McGraw-Hill, 2009, ISBN-978-0-07-061223-5.

Reference Books:

1. John Krauss and Daniel A Fleisch, "Electromagnetics with applications", McGraw-Hill.
2. N. Narayana Rao, "Fundamentals of Electromagnetics for Engineering", Pearson.

Professor & Head
Dept. of Electronics & Communication Engineering
City Engineering College,
Bangalore-560 061.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN | 1 | C | E | | | | | | | |

COURSE CODE: 18EC55

CITYENGINEERING COLLEGE

Kanakapura Road, Doddakallasandra, Bengaluru - 560062

FIRST INTERNAL TEST

G.S malliknarjuna

Programme:BE
Course Name: Electromagnetic waves
Sem: V Sem'A Sec
Duration: 1 ½Hrs

Date: 10/11/2021
Time: 10:00AM – 11:30 AM

MAX MARKS: 50

Note: Answer any FIVEquestions choosing at leastONE from eachPart.

			CO'S	BT'S
	Part – A			
1.	(a)State and explain Coulomb's law in vector form. Mention the units of each parameter used in the expression. (b) Define Electric Field Intensity and Electric flux density	**6+4**	**CO1**	**BT1,BT2**
	Or			
2.	Point charges of 50nc each are located at A(1,0,0) B(-1,0,0), C(0,-1,0) and D(0,-1,0)m. Find the total force on a charge at A and also find Electric Field Intensity.	**10**	**CO1**	**BT1,BT2**
	Part – B			
3.	(a) Derive an expression for total Force due to n number of point charges. (b) Explain about different types of charge distribution.	**4+6**	**CO1**	**BT1,BT2**
	Or			
4.	Derive the expression for 'E' due to an infinite uniformly charged line of density ρ_l C/m at a point P.	**10**	**CO1**	**BT1,BT2**
	Part-C			
5.	(a) A point charge Q=30nC is located at the origin in Cartesian coordinates. Find the electric flux density and electric field intensity at (1, 3,-4) m. (b) It is required to hold four equal point charges each in equilibrium at the corners of a square.find the point charge which will do this, if placed at the centroid of the square.	**5+5**	**CO1**	**BT1,BT2**
	Or			
6.	Derive an expression for electric field due to infinite sheet of charge	**10**	**CO1**	**BT1,BT2**
	Part-D			
7.	(a)Establish the relationship between E & D (b) Explain Gaussian surface with examples.	**5+5**	**CO1**	**BT1,BT2**
	Or			
8.	Define Electric flux Density **'D'**. Find the **D** at **P(6, 8, -10)** caused by i) a point charge of **30 mC** at origin. ii) a uniform line charge of **ρ_l = 40 µC/m** on z-axis. iii) A uniform surface charge of density **ρ_s = 57.2 µC/m2** on the plane **x =9.**	**10**	**CO1**	**BT1,BT2**
	Part-E			
9.	Derive an expression for electric field at a point on the axis of the circular ring.	**10**	**CO1**	**BT1,BT2**
	Or			
10	Two particles having charges 2nc & 5nc are separated 0.5m	**10**	**CO1**	**BT1,BT2**

ATTESTED COPY

G.S. malliknarjuna

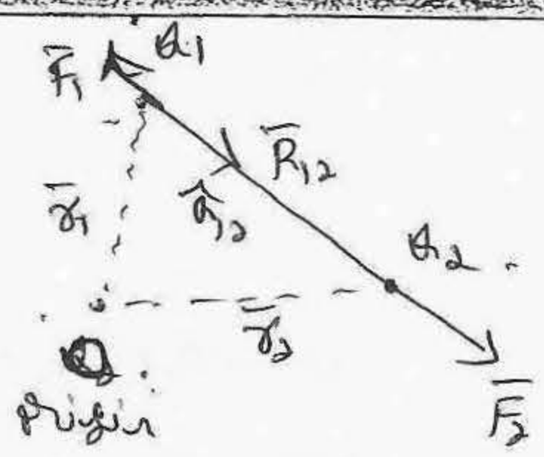
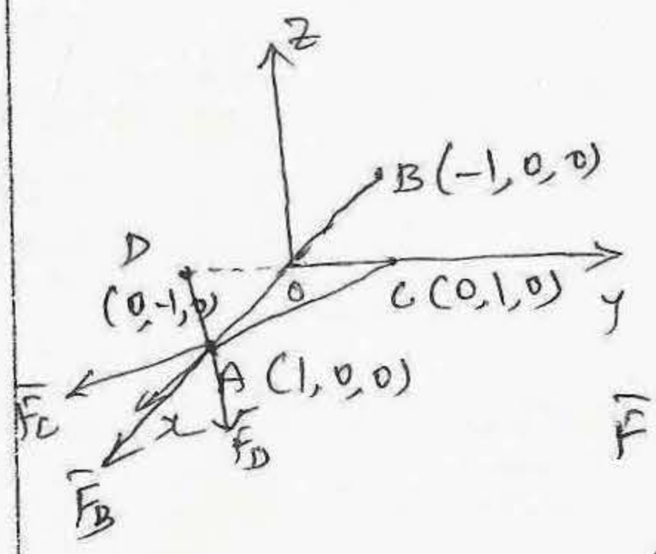
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERIN COLLEGE
DEPARTMENT OF Electronics and Communication.

SCHEME FOR VALUATION

Internal Test #1

Semester & Section: 5th & 'A' Date: 10/11/21

Question No.	Details of the Answer	Marks Distribution	Total Marks
1 (a)	 $\vec{F}_2 = \frac{1}{4\pi\epsilon_0} \frac{q_1 q_2}{\lvert R_{12}\rvert^2} \cdot \hat{R}_{12}$	02	(06)
	$\hat{R}_{12} = \frac{\vec{R}_{12}}{\lvert\vec{R}_{12}\rvert} = \frac{\vec{\gamma}_2 - \vec{\gamma}_1}{\lvert\vec{\gamma}_2 - \vec{\gamma}_1\rvert}$	04	
	statement		
(b)	Electric field ($\vec{E}$) = force/unit charge = F/q $\vec{E} = \frac{q}{4\pi\epsilon\gamma_{1P}^2} \cdot \hat{R}_{1P}$	02.	(04)
	Electric flux density ($\vec{D}$) = flux/unit surface area $\vec{D} = \frac{q}{4\pi\gamma^2} \cdot \hat{R}$	02	
2.	 $q = 50\,nC$		
	$\vec{F}_A = \vec{F}_B + \vec{F}_C + \vec{F}_D$	-02-	
	$\vec{F} = \frac{qQ}{4\pi\epsilon_0\gamma^2} \cdot \hat{R}\gamma$	-02-	(10)
	$\vec{F} = \frac{50n \times 50n}{4\pi\epsilon_0} \left[\frac{\vec{a}_{BA}}{R_{BA}^2} + \frac{\vec{a}_{CA}}{R_{CA}^2} + \frac{\vec{R}_{DA}}{R_{DA}^3} \right]$	-02-	
	$\vec{F} = 2.153 \times 10^{-15} \hat{a}_x\ N$	-02-	
	$\vec{E} = \vec{E}_1 + \vec{E}_2 + \vec{E}_3 = \frac{Q}{4\pi\epsilon_0} \left[\frac{\vec{a}_{BA}}{R_{BA}^2} + \frac{\vec{R}_{CA}}{R_{CA}^3} + \frac{\vec{R}_{DA}}{R_{DA}^3} \right]$	-02-	
	$= \frac{2.153}{50 \times 10^{-9}} \times 10^{-15} \hat{a}_x\ V/m$		

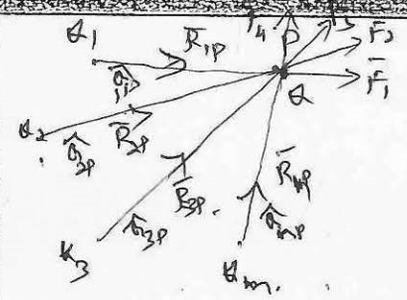
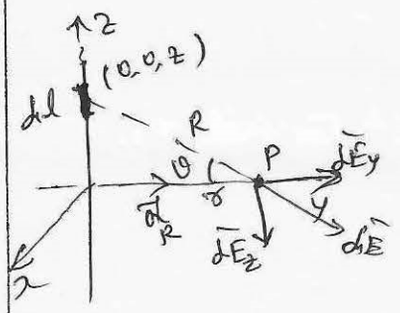
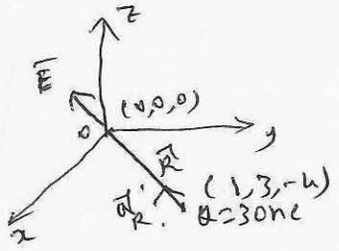
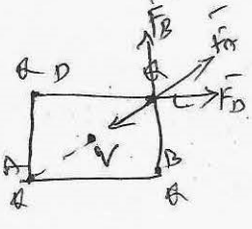
Ravindra S.

Staff

ATTESTED COPY
Skaran
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

C.S. Malliswamy

HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
3 (a)	 $\bar{F}_1 = \frac{Q_1 Q}{4\pi\epsilon_0 R_{1P}^2}\cdot\bar{a}_{1P}$ $\bar{F}_2 = \frac{Q_2 Q}{4\pi\epsilon_0 R_{2P}^2}\cdot\bar{a}_{2P}$ $\bar{F}_n = \frac{Q_n Q}{4\pi\epsilon_0 R_{nP}^2}\cdot\bar{a}_{nP}$ $\bar{F} = \frac{Q}{4\pi\epsilon_0}\sum_{i=1}^{n}\frac{Q_i}{R_{iP}^2}\cdot\bar{a}_{iP}$	04	(04)
(b)	(1) Point charge. (2) line charge (3) Surface charge (4) Volume charge.	1½ × 4	(06)
4	 $dQ = \rho_L\,dl = \rho_L\,dz$ $d\bar{E} = \frac{dQ}{4\pi\epsilon_0 R^2}\cdot\bar{a}_R$ $\lvert\bar{R}\rvert = \sqrt{r^2+z^2}$ $\bar{a}_R = \frac{r\bar{a}_r - z\bar{a}_z}{\sqrt{r^2+z^2}}$ $\bar{E} = \int_{-\infty}^{+\infty} d\bar{E} = \frac{\rho_L}{4\pi\epsilon_0}\frac{r\,dz\,\bar{a}_r}{(r^2+z^2)^{3/2}}$ $\bar{E} = \frac{\rho_L}{2\pi\epsilon_0 r}\cdot\bar{a}_r$	-02- -02- -02- -02- -02-	(10)
5 (a)	 $\bar{R} = -\bar{a}_x - 3\bar{a}_y + 4\bar{a}_z$ $\lvert\bar{R}\rvert = \sqrt{1^2+3^2+4^2} = \sqrt{26}$ $\bar{E} = \frac{Q}{4\pi\epsilon R^2}\cdot\bar{a}_R = 5(-1.48\bar{a}_x - 0.74\bar{a}_y + 1.11\bar{a}_z)$ V/m	-02- -02- -01-	(5)
(b)	 $\bar{F}_t = \bar{F}_B + \bar{F}_C + \bar{F}_D + \bar{F}_E$ $\bar{F}_t = \frac{Q}{4\pi\epsilon_0 a^2}\left[\left(-1.3535Q - \frac{q}{\sqrt{0.5}}\right)\bar{a}_x + \left(-1.3535Q - \frac{q}{\sqrt{0.5}}\right)\bar{a}_z\right]$ $q = -1.3535\times\sqrt{0.5}\,Q$ $q = -0.3571\,Q$, C	-02- -02- -01-	(5)

Staff

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

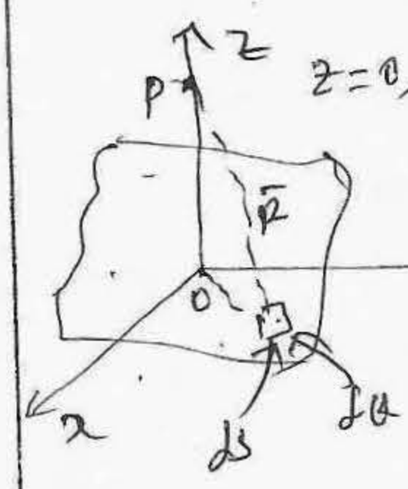
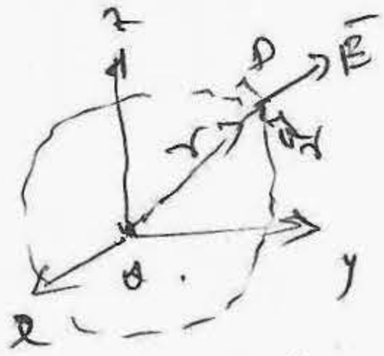
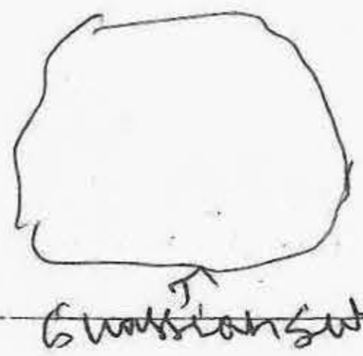
HOD

CITY ENGINEERIN COLLEGE
DEPARTMENT OF .....

SCHEME FOR VALUATION

Internal Test _____

Semester & Section: Date:

Question No.	Details of the Answer	Marks Distribution	Total Marks
6.	 $dQ = \rho_s ds = \rho_s r dr d\phi$ $\bar{dE} = \frac{dQ}{4\pi\epsilon_0 R^2} \cdot \bar{a}_R = \frac{\rho_s r dr d\phi}{4\pi\epsilon_0 R^2} \cdot \bar{a}_R$ $\bar{R} = \sqrt{r^2+z^2}$; $\bar{a}_R = \frac{-r\bar{a}_r + z\bar{a}_z}{\sqrt{r^2+z^2}}$ $\bar{dE} = \frac{\rho_s r dr d\phi}{4\pi\epsilon_0 (\sqrt{r^2+z^2})^2} \left[\frac{-r\bar{a}_r + z\bar{a}_r}{\sqrt{r^2+z^2}}\right]$ $\bar{E} = \int \bar{dE} = \int_{\phi=0}^{2\pi} \int_0^{\infty} \frac{\rho_s r dr d\phi}{4\pi\epsilon_0 (r^2+z^2)^{3/2}} (z\bar{a}_z)$ $\bar{E} = \frac{\rho_s}{2\epsilon_0} \cdot \bar{a}_n \cdot V/m.$	-02- -02- -02- -02- -02-	10
7 (a)	 $\bar{E} = \frac{Q}{4\pi\epsilon_0 r^2} \cdot \bar{a}_r$. $\bar{D} = \frac{\psi}{4\pi r^2} \cdot \bar{a}_r$. but $\psi = Q$ $\epsilon_0 \bar{E} = \frac{Q}{4\pi r^2} \cdot \bar{a}_r$. $\therefore \bar{D} = \epsilon \bar{E}$	-05-	05
(b)	 * Surface is irregular * It must be closed * $\bar{D}$ is normal & tangential to surface.	-05-	05

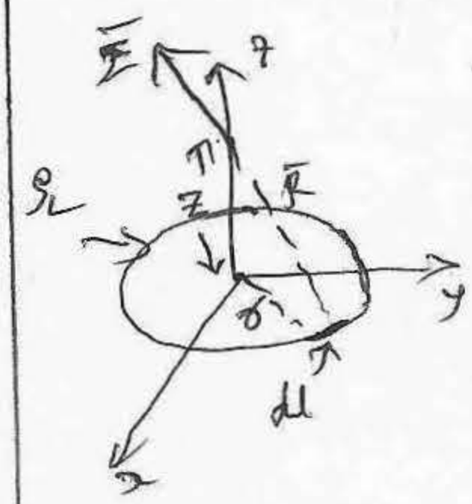
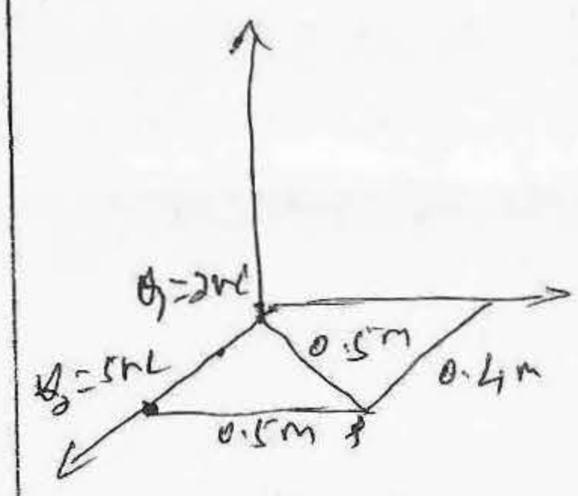
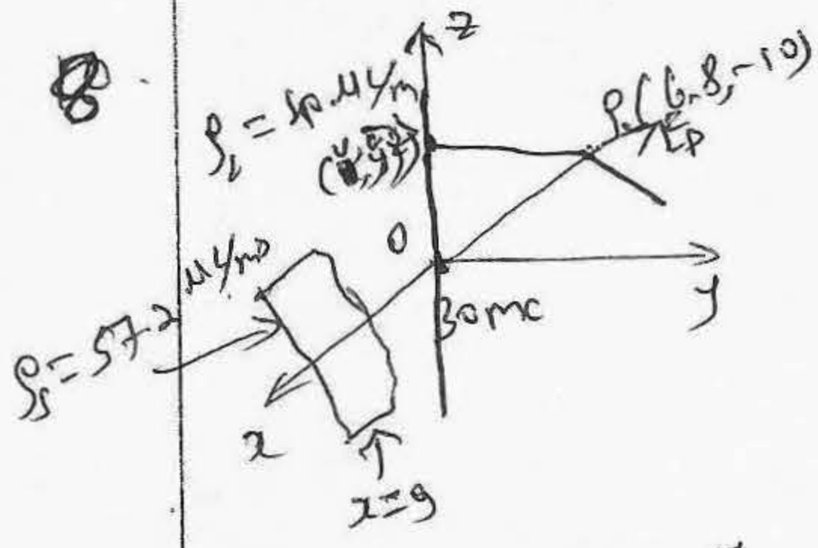
Ramanatha S.

Staff

C.S. Malliswamy

HOD

ATTESTED COPY
skaran
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Question No.	Details of the Answer	Marks Distribution	Total Marks
9	 $dQ = \rho_L dl$ $d\bar{E} = \frac{\rho_L dl}{4\pi\epsilon_0 R^2}\vec{a}_R$ $(\bar{R}) = \sqrt{r^2+z^2}$ $\hat{a}_R = \frac{-r\vec{a}_r + z\vec{a}_z}{\sqrt{r^2+z^2}}$ $d\bar{E} = \frac{\rho_L (r\,d\phi)}{4\pi\epsilon_0 (r^2+z^2)^{3/2}} z\vec{a}_z$ $\bar{E} = \int d\bar{E} = \int_0^{2\pi} \frac{\rho_L (r\,d\phi)}{4\pi\epsilon_0 (r^2+z^2)^{3/2}} z\vec{a}_z$ $\therefore \bar{E} = \frac{\rho_L r z}{2\epsilon_0 (r^2+z^2)^{3/2}}\vec{a}_z$	−02− −02− −02− −02− −02−	10
10	 $\bar{E_1} = \frac{Q_1}{4\pi\epsilon_0 R_{P0}^2}\cdot\vec{a}_{P0}$ $\bar{E_1} = 57.52\vec{a}_x + 43.14\vec{a}_y$, V/m $E_2 = \frac{Q_2}{4\pi\epsilon R_{P0}^2}\cdot\vec{a}_{P0}$ $\bar{E_2} = -28.76\vec{a}_x + 21.57\vec{a}_y$, V/m $\bar{E} = \bar{E_1} + \bar{E_2} = 28.7608\vec{a}_x + 64.711\vec{a}_y$, V/m	−04− −04− −02	10
8	 (1) $\bar{D} = \frac{Q}{4\pi r^2}\cdot\vec{a}_r$ (2) $\bar{E} = \frac{\rho_L}{2\pi\epsilon_0 r}\cdot\vec{a}_r$ $\bar{D} = \epsilon\bar{E}$ (3) $\bar{E} = \frac{\rho_s}{2\epsilon_0}$ $\bar{D} = \epsilon\bar{E}$ (i) $\bar{r} = 6\vec{a}_x + 8\vec{a}_y - 10\vec{a}_z$ $\|\bar{r}\| = \sqrt{6^2+8^2+10^2} = \sqrt{200} = 10\sqrt{2}$ Ω $\vec{a}_r = \frac{\bar{r}}{\|\bar{r}\|}$ (ii) $\bar{r} = 6\vec{a}_x + 8\vec{a}_y$ $\|\bar{r}\| = \sqrt{6^2+8^2} = 100 = 10$ $\vec{a}_r = \frac{\bar{r}}{\|\bar{r}\|} = \frac{6\vec{a}_x + 8\vec{a}_y}{10}$ (iii) $\bar{D} = 6.75\times10^{-6}\vec{a}_x + 9.00\times10^{-6}\vec{a}_y - 11.254\times10^{-6}\vec{a}_z$, C/m²	−03− −04− −03−	10

Staff

HOD

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN | 1 | C | E | | | | | | | |

COURSE CODE: 18EC55

CITYENGINEERING COLLEGE

Kanakapura Road, Doddakallasandra, Bengaluru - 560062

SECOND INTERNAL TEST

Programme:BE
Course Name: Electromagnetic waves
Sem: V Sem'A Sec
Duration: 1 ½Hrs

Date: 15/12/2021
Time: 10:00AM – 11:30 AM

MAX MARKS: 50

Note: Answer any FIVEquestions choosing at leastONE from eachPart.

			CO'S	BT'S
	Part – A			
1.	Derive the expression for D due to the infinite sheet of charge placed in Z=0 plane, using Gauss' law.	**10**	**CO1**	**BT1,BT2**
	Or			
2.	(a).Define divergence & its physical meaning. (b) .State & prove Gauss's law.	**10**	**CO1**	**BT1,BT2**
	Part – B			
3.	(a).State &prove Gauss' Divergence theorem. (b).Let Đ = $(2y^2z-8xy)\,\hat{a}_x + (4xyz-4x^2)\,b_{\hat{y}} + (2xy^2-4z)\,\hat{c}_z$.Determine the total charge with in a volume of 10^{-14} m^3 located at P (1,-2, 3).	**4+6**	**CO1**	**BT1,BT2**
	Or			
4.	Two uniform line charges of density **8 nC/m** are located in a plane **y = 0 at x = +4m & x=- 4m**. Find 'E' at **P (0, 4, 10) m**.	**10**	**CO1**	**BT1,BT2**
	Part-C			
5.	Define Electric flux Density **'D'**. Find the **D** at **P(6, 8, -10)** caused by i) a point charge of **30 mC** at origin. ii) a uniform line charge of **ρl = 40 µC/m** on z-axis. iii) A uniform surface charge of density **ρs = 57.2 µC/m2** on the plane **x =9.**	**10**	**CO1**	**BT1,BT2**
	Or			
6.	In a certain region of space Đ=$2xy\,\hat{a}_x+3yz\,b_{\hat{y}}+4zx\,\hat{c}_z$.Evaluate the amount of electrical flux that passes through the portion bounded by -1≤ y <2, 0≤ y <4 in the x=3 plane using Gauss' law.	**10**	**CO1**	**BT1,BT2**
	Part-D			
7.	(a) Derive Maxwell's first equation in electrostatics. (b) Derive an expression for potential due to a point charge.	**5+5**	**CO1**	**BT1,BT2**
	Or			
8.	Obtain an expression for the energy expended in moving a point charge in an electric field.	**10**	**CO1**	**BT1,BT2**
	Part-E			
9.	Calculate the divergence of vector D at the points specified using Cartesian and Cylindrical coordinates: 1. $\vec{D} = \frac{1}{z^2}[10xyz.a_x + 5x^2z.a_y + (2z^3 - 5x^2y)a_z]$ c/m² at point P(2,3,5) 2. $\vec{D} = 5z^2.a_r + 10rz.a_z$ at p(3, 45°,5)	**10**	**CO1**	**BT1,BT2**
	Or			
10	(a) define potential difference and absolute potential. (b) Establish the relation $\bar{E} = -\nabla V$.	**5+5**	**CO1**	**BT1,BT2**

Blooms Taxonomy Levels (BTL):

BT1-Remembering **BT2**- Understanding **BT3** – Applying **BT4** – Analysing **BT5**-Evaluating

Course Outcomes (CO's):

CO1: Understanding the concepts of Electric field, Electric density, Gauss's Law and its application, Divergence theorem and work done.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

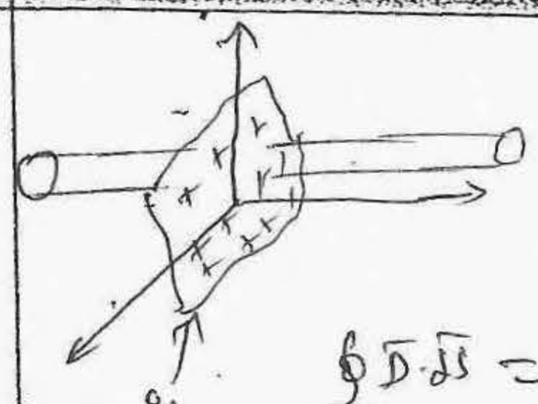
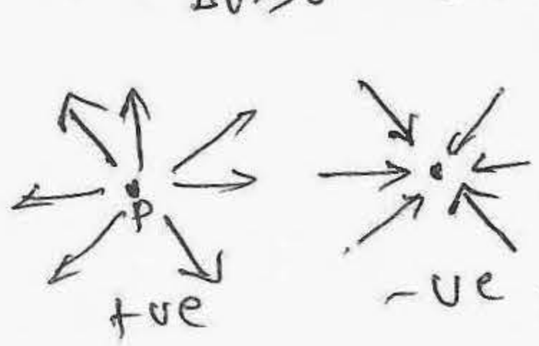
CITY ENGINEERIN COLLEGE
DEPARTMENT OF Electronics & Communication

SCHEME FOR VALUATION

Internal Test #2

Semester & Section: 5th & A

Date: 15/12/21

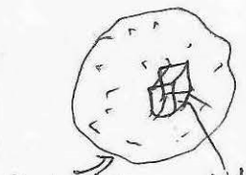
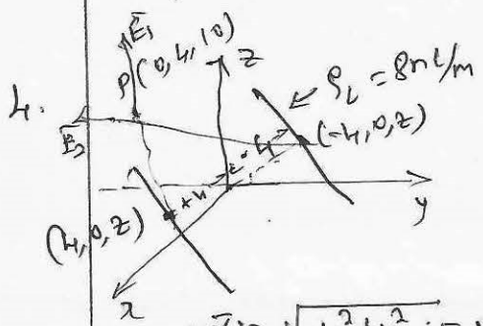
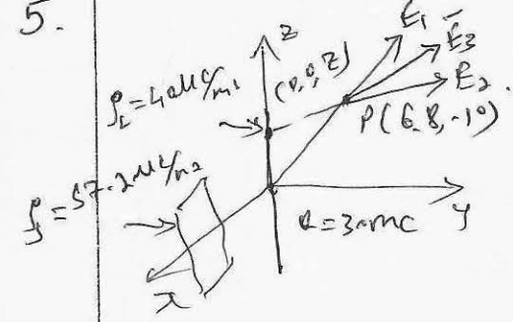
Question No.	Details of the Answer	Marks Distribution	Total Marks
1	 $\Psi = \oint \bar{D} \cdot d\bar{s}$ $= \oint \bar{D} \cdot d\bar{s} + \oint \bar{D} \cdot d\bar{s} + \int \bar{D} \cdot d\bar{s}$ sides for bottom $\oint \bar{D} \cdot d\bar{s} = 0$, $\oint \bar{D} \cdot \hat{a}_z ds = \oint \bar{D} \cdot \hat{a}_z ds = A$ sides top bottom $\Psi = 2D_z A$; $\Psi = S_s \times A$ $\bar{E} = \frac{S_s}{2\varepsilon_0} \hat{a}_z$ V/m	-02- -02- -02- -02- -02-	(10)
2.(a)	$DIV\ \bar{A} = \lim_{\Delta V \to 0} \frac{\oint \bar{A} \cdot d\bar{s}}{\Delta V} = \frac{\partial A_x}{\partial x} + \frac{\partial A_y}{\partial y} + \frac{\partial A_z}{\partial z}$ 	-03- -02-	(05)
(b)	statement $d\Psi = D_n ds$ $D_n = \lvert\bar{D}\rvert \cdot \cos\theta$ $d\Psi = \bar{D} \cdot d\bar{s}$ $\Psi = \int d\Psi = \oint_s \bar{D} \cdot d\bar{s}$	-02- -03	(05)
3.(b)	$\bar{D} = (2y^2z - 8xy)\hat{a}_x + (4xyz - 4x^2)\hat{a}_y + (2xy^2 - 4z)\hat{a}_z$ $Q = \int_V \nabla \cdot \bar{D} \cdot dv = \int_V dQ$. $\nabla \cdot \bar{D} = \frac{\partial D_x}{\partial x} + \frac{\partial D_y}{\partial y} + \frac{\partial D_z}{\partial z} = -8y + 4xz - 4$ $\nabla \cdot \bar{D} = -8$. $dQ = -8 \times 10^{-4} = -800\,nC$.	-02- -04-	(06)

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Question No.	Details of the Answer	Marks Distribution	Total Marks
3(a)	$\oint \bar{D} \cdot d\bar{s} = \int \nabla \cdot \bar{D}\, dv = \int \rho_v\, dv$.		
	Statement		
			
	$\psi = \oint \bar{D} \cdot d\bar{s}$	−02−	04
	$\rho_v = \frac{d\psi}{dv}$	−02−	
	$d\psi = \rho_v \cdot dv$.		
	$\int d\psi = \int \rho_v\, dv$.		
	but $\nabla \cdot \bar{D} = \rho_v$		
	$\psi = \oint \bar{D} \cdot d\bar{s} = \int \nabla \cdot \bar{D} \cdot dv$.		
4.			
	$\bar{E} = \bar{E}_1 + \bar{E}_2$	−02−	
	$\bar{E}_1 = \frac{\rho_L}{2\pi\varepsilon_0 r_1} \cdot \bar{a}_{r_1}$	−02−	10
	$\bar{E}_2 = \frac{\rho_L}{2\pi\varepsilon_0 r_2} \cdot \bar{a}_{r_2}$.	−02−	
	$\bar{r}_1 = -4\bar{a}_x + 4\bar{a}_y$	−02−	
	$\lvert\bar{r}_1\rvert = \sqrt{4^2+4^2} = \sqrt{32}$. $\therefore \lvert\bar{r}_2\rvert = \sqrt{32}$. $\bar{r}_2 = +4\bar{a}_x + 4\bar{a}_y$.	−02−	
5.			
	(1) $\bar{D} = \frac{Q}{4\pi r^2} \cdot \bar{a}_r$	−02−	
	(2) due to line charge $\bar{D} = \frac{\rho_L}{2\pi r} \cdot \bar{a}_r$	−02−	10
	(3) $\bar{D} = \frac{\rho_s}{2} \cdot \bar{a}_n$.		
	(1) $\bar{r} = 6\bar{a}_x + 8\bar{a}_y - 10\bar{a}_z$	−02−	
	$\lvert\bar{r}\rvert = \sqrt{6^2+8^2+(-10)^2} = \sqrt{200} = 10\sqrt{2}$.		
	$\bar{a}_r = \frac{\bar{r}}{\lvert\bar{r}\rvert}$		
	(2) $\bar{r} = 6\bar{a}_x + 8\bar{a}_y$ $\quad \bar{a}_r = \frac{\bar{r}}{\lvert\bar{r}\rvert} = \frac{6\bar{a}_x + 8\bar{a}_y}{10}$	−02−	
	$\lvert\bar{r}\rvert = \sqrt{6^2+8^2} = 100 = 10$		
	(3) $\bar{D} = \frac{57.2\times10^{-6}}{2} = 28.6\times10^{-6}\ C/m^2$.	−02−	
	(1) $\bar{D} = 6.75\times10^{-6}\bar{a}_x + 9\times10^{-6}\bar{a}_y - 11.25\times10^{-6}\bar{a}_z$		

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

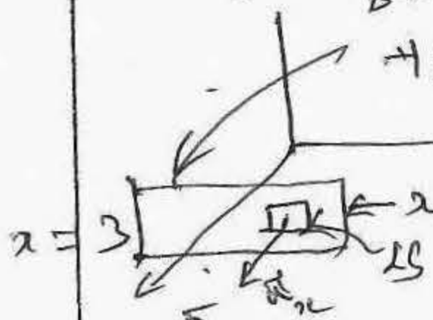
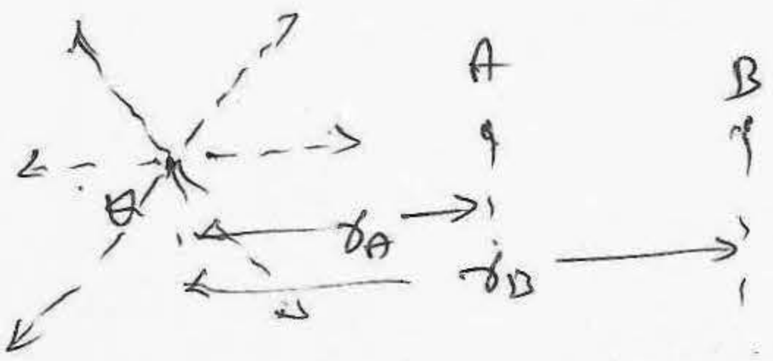
CITY ENGINEERIN COLLEGE

DEPARTMENT OF Electronics & Communication

SCHEME FOR VALUATION

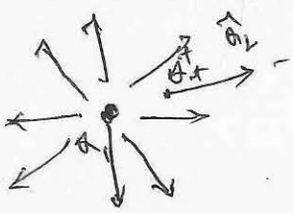
Internal Test #2

Semester & Section: 5th & 'A' Date: 15/12/21

Question No.	Details of the Answer	Marks Distribution	Total Marks
6.	$\vec{D} = 2xy\,\vec{a}_x + 3yz\,\vec{a}_y + 4zx\,\vec{a}_z$ Bounded by $-1 \le y \le 2$, $0 \le z \le 4$,  $d\vec{s} = dy\,dz\,\vec{a}_x$ $\vec{D}\cdot d\vec{s} = 2xy\,dy\,dz$ $\psi = \oint_S \vec{D}\cdot d\vec{s} = \int_{z=0}^{4}\int_{y=-1}^{2} 2xy\,dy\,dz$ $= 2x \times 4 \times 1.5 = 12x$ $\psi = 12 \times 3 = 36\,C.$	—02— —02— —02— —02— —02—	10
7(a)	$Div\,\vec{D} = \lim_{\Delta V \to 0} \frac{\oint \vec{D}\cdot d\vec{s}}{\Delta V}$ $\psi = \phi = \oint_S \vec{D}\cdot d\vec{s}$ $\frac{\phi}{\Delta V} = \frac{\oint \vec{D}\cdot d\vec{s}}{\Delta V}$ $\lim_{\Delta V \to 0}\left[\frac{\phi}{\Delta V}\right] = \lim_{\Delta V \to 0}\left[\frac{\oint \vec{D}\cdot d\vec{s}}{\Delta V}\right]$ $\rho_v = \nabla\cdot\vec{D}$	—01— —02— —02—	05
(b)	 $\vec{E} = \frac{Q}{4\pi\epsilon_0 r^2}\vec{a}_r$ $d\vec{l} = dr\,\vec{a}_r + r\,d\theta\,\vec{a}_\theta + r\sin\theta\,d\phi\,\vec{a}_\phi$ $V_{AB} = -\int_B^A \vec{E}\cdot d\vec{l}$ $V_{AB} = \frac{Q}{4\pi\epsilon_0}\left(\frac{1}{r_A} - \frac{1}{r_B}\right), V$	—02— —03—	05

Staff HOD

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Question No.	Details of the Answer	Marks Distribution	Total Marks
8.	 $\bar{F} = Q\bar{E}$ $\bar{F}_L = \bar{F} \cdot \hat{a}_L = Q_t \bar{E} \cdot \hat{a}_L$ $\bar{F}_{applied} = -\bar{F}_L = Q_t \bar{E} \cdot \hat{a}_L$ $dW = \bar{F}_{applied} \cdot d\bar{l}$ $dW = -Q_t \bar{E} \cdot \hat{a}_L \cdot dl$ $dW = -Q_t \bar{E} \cdot d\bar{L}$ $W = \int dW = \int -Q_t \bar{E} \cdot d\bar{L}$ $W = -Q \int_{Ini}^{Fin} \bar{E} \cdot d\bar{L}$	-02- -02- -02- -02- -02-	10
9	$\bar{D} = \frac{1}{z^2}\left[10xyz\,\hat{a}_x + 5x^2z\,\hat{a}_y + (2z^3 - 5x^2y)\hat{a}_z\right]$ C/m^2 at P(2,3,5) $\bar{D} = 5z^2\hat{a}_x + 10xz\,\hat{a}_z$, P(3, 45°, 5) $\nabla \cdot \bar{D} = \frac{\partial D_x}{\partial x} + \frac{\partial D_y}{\partial y} + \frac{\partial D_z}{\partial z}$; $\nabla \cdot \bar{D} = \frac{1}{r}\frac{\partial}{\partial r}(rA_r) + \frac{1}{r}\frac{\partial A_\phi}{\partial \phi} + \frac{\partial A_z}{\partial z}$ 05+05	10
10. (a)	* One Joule of work done in moving unit charge from one point to other in the field $\bar{E}$ * potential measured w.r.t. ground. $V_{AB} = V_A - V_B$; $V_A = \frac{Q}{2\pi\varepsilon_0 r_A}$ V	-02- -03	05
(b)	$dW = -\bar{E} \cdot d\bar{l}$; $dV = -\bar{E} \cdot d\bar{l}$ $\bar{E}\,(dx \cdot \hat{a}_x + dy \cdot \hat{a}_y + dz \cdot \hat{a}_z) = -\left(\frac{\partial}{\partial x}\hat{a}_x + \frac{\partial}{\partial y}\hat{a}_y + \frac{\partial}{\partial z}\hat{a}_z\right) V\,(dx\,\hat{a}_x + dy\,\hat{a}_y + dz\,\hat{a}_z)$ $\bar{E} = -\nabla V$	-02- -03-	05

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN | 1 | C | E | | | | | | | |

COURSE CODE: **18EC55**

CITYENGINEERING COLLEGE

Kanakapura Road, Doddakallasandra, Bengaluru - 560062

SECOND INTERNAL TEST

Programme:BE
Course Name: Electromagnetic waves
Sem: V Sem'A Sec
Duration: 1 ½Hrs

Date: 27/1/2022
Time: 10:00AM – 11:30 AM

MAX MARKS: 50

Note: Answer any FIVEquestions choosing at leastONE from eachPart.

			CO'S	BT'S
	Part – A			
1.	Using Gauss Law derive Poisson's and Laplace equation. Represent Laplacian in Cartesian, Cylindrical and Spherical co-ordinates.	10	CO1	BT1,BT2
	Or			
2.	Determine whether or not the following potential satisfy the Laplace's equation. (i)$V=2x^2-4y^2+z^2$ (ii) .	10	CO1	BT1,BT2
	Part – B			
3.	Using laplace's equation, find capacitance per unit length of two concentric sphere with inner radius 'a'm and outer radius 'b'm with boundary conditions $V=V_0$ at r=a and V=0 at r=b,b>a.	10	CO1	BT1,BT2
	Or			
4.	Using Laplace Equation derive the expression for capacitance of a cylindrical capacitor. Assume the potential is a function of ρ only. The boundary conditions are $V = V_0$ at ρ=a and V = 0 at ρ =b, b > a.	10	CO1	BT1,BT2
	Part-C			
5.	Conducting planes at φ= 10° and φ= 0° in cylindrical coordinates have voltages 75V and 0V respectively. Obtain the expression for Electric flux density D in the region between the planes which contains a material for which $\varepsilon_r = 1.65$.	10	CO1	BT1,BT2
	Or			
6.	(a) State and explain Biot-savart law (b) State and prove Stroke's theorem.	10	CO1	BT1,BT2
	Part-D			
7.	(a)State and prove Lorentz's force equation. (b)Obtain the expression for magnetic force on differential current element.	5+5	CO1	BT1,BT2
	Or			
8.	Derive magnetic boundary condition between the two different magnetic materials.	10	CO1	BT1,BT2
	Part-E			
9.	Explain the following (a) motional e.m.f (b) transformer e.m.f	10	CO1	BT1,BT2
	Or			
10	Write Maxwell's equation in point form & integral form	5+5	CO1	BT1,BT2

Blooms Taxonomy Levels (BTL):
BT1-Remembering **BT2**- Understanding **BT3** – Applying **BT4** – Analysing **BT5**- Evaluating

Course Outcomes (CO's):
CO1: Understanding the concepts of Laplace and Poisson's equation, steady magnetic field and magnetic material.

C.S. Malliknarjuna

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

INTERNAL TEST NO. : ....#3....

SCHEME OF VALUATION

Sub Code: 18EC55 Sub Name: Electromagnetic Waves Sem & Sec: 5th 'A'

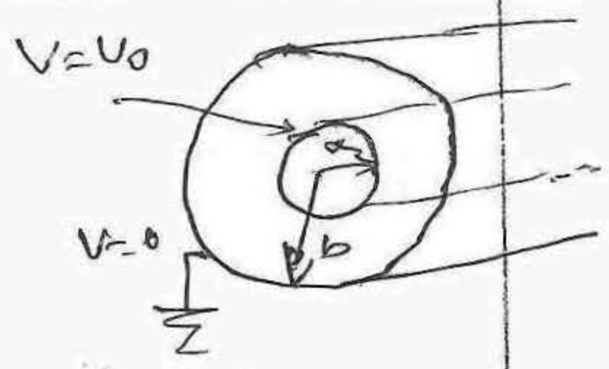
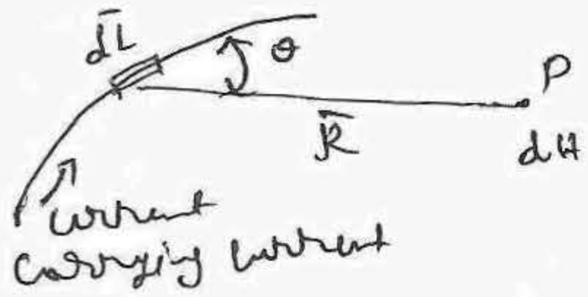
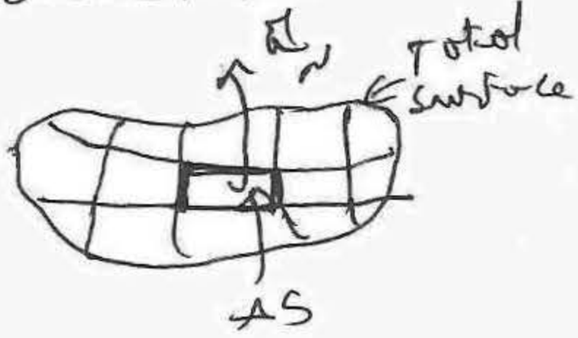
Q. No.	Details of the Answer	Marks Distribution	Total Marks
1.	$\nabla \cdot \bar{D} = \rho_v$; $\bar{D} = \epsilon \bar{E}$ $\nabla \cdot \epsilon \bar{E} = \rho_v \Rightarrow \nabla \cdot \bar{E} = \frac{\rho_v}{\epsilon}$. but $\bar{E} = -\nabla V$ $\nabla \cdot (-\nabla V) = \frac{\rho_v}{\epsilon} \Rightarrow \nabla \cdot \nabla V = -\frac{\rho_v}{\epsilon} \Rightarrow \nabla^2 V = -\frac{\rho_v}{\epsilon}$ $\nabla^2 V = -\frac{\rho_v}{\epsilon}$; poisson's eqn. If $\rho_v = 0$, $\nabla^2 V = 0$; Laplace eqn. $\nabla^2 V = \frac{\partial^2 V}{\partial x^2} + \frac{\partial^2 V}{\partial y^2} + \frac{\partial^2 V}{\partial z^2} = 0$ $\nabla^2 V = \frac{1}{r}\frac{\partial}{\partial r}\left(r \frac{\partial V}{\partial r}\right) + \frac{1}{r^2}\left(\frac{\partial^2 V}{\partial \phi^2}\right) + \frac{\partial^2 V}{\partial z^2} = 0$ $\nabla^2 V = \frac{1}{r^2}\frac{\partial}{\partial r}\left(r^2 \frac{\partial V}{\partial r}\right) + \frac{1}{r^2 \sin\theta}\frac{\partial}{\partial \theta}\left(\sin\theta \frac{\partial V}{\partial \theta}\right) + \frac{1}{r^2 \sin^2\theta}\frac{\partial^2 V}{\partial \phi^2} = 0$	05 05	10
2.	(i) $\nabla^2 V \neq 0$, (ii) $\nabla^2 V = 0$, (iii) $\nabla^2 V = 0$	2+4+4	10.
3.	$\nabla^2 V = 0$ $\frac{1}{r^2}\frac{\partial}{\partial r}\left(r^2 \frac{\partial V}{\partial r}\right) = 0$ $V = -\frac{C_1}{r} + C_2$. $C_1 = \frac{V_0}{[1/b - 1/a]}$; $C_2 = \frac{V_0}{b[1/b - 1/a]}$ $\bar{E} = -\frac{V_0}{(1/b - 1/a) r^2} \vec{a}_r$, V/m $C = \frac{Q}{V_0} = \frac{4\pi\epsilon}{(\frac{1}{a} - \frac{1}{b})}$. F.	 -02- -02- -02- -02- -02-	10

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Q. No.	Details of the Answer	Marks Distribution	Total Marks
4	$\nabla^2 V = 0$, 	2	10
	$\frac{1}{\rho}\frac{\partial}{\partial\rho}\left(\rho\frac{\partial V}{\partial\rho}\right)=0$	2	
	$V = C_1 \ln\rho + C_2$,		
	$C_1 = \frac{+V_0}{\ln(a/b)}$, $C_2 = \frac{-V_0 \ln(b)}{\ln(a/b)}$	2	
	$\vec{E} = -\frac{V_0}{\rho \ln(a/b)} \cdot \vec{a}_\rho$. V/m.	2	
	$C = \frac{2\pi\epsilon}{\ln(b/a)}$, F/m	2.	
5	$\nabla^2 V = \frac{1}{\rho^2}\frac{\partial^2 V}{\partial\phi^2} = 0$		10.
	$V = -1.5\phi + 65$		
6 (a)	Statement 		
	$d\vec{H} \propto \frac{I\,dl\sin\theta}{R^2}$.	2	
	$d\vec{H} = \frac{KI\,dl\sin\theta}{R^2}$.	3	
	$d\vec{H} = \frac{I\,dl\sin\theta}{4\pi R^2}$.		10
	$d\vec{H} = \frac{I\,d\vec{l}\times\vec{R}}{4\pi R^3}$ A/m		
(b)	Statement 		
	$\oint_L \vec{H}\cdot d\vec{l} = \int_S (\nabla\times\vec{H})\cdot d\vec{S}$	2+3	

Staff

HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
7(a)	$\bar{F}_e = q\bar{E}$ $\bar{F}_m = q\bar{v}\times\bar{B}$ $\bar{F} = \bar{F}_e + \bar{F}_m = q(\bar{E} + \bar{v}\times\bar{B})$ $\bar{F} = m\bar{a} = m\frac{d\bar{v}}{dt} = q(\bar{E} + \bar{v}\times\bar{B})$.	02+03	05
(b)	$d(d\bar{F}_1) = I_1 d\bar{L}_1 \times d\bar{B}_2$. $d\bar{B}_2 = \mu_0 d\bar{H}_2 = \mu_0\left[\frac{I_2 d\bar{L}_2 \times \bar{a}_{R_{21}}}{4\pi R_{21}^2}\right]$ $\bar{F}_1 = \frac{\mu_0 I_1 I_2}{4\pi}\oint_{L_1}\oint_{L_2}\frac{d\bar{L}_1 \times (d\bar{L}_2 \times \bar{a}_{R_{21}})}{R_{21}^2}$ $\bar{F}_2 = \frac{\mu_0 I_2 I_1}{4\pi}\oint_{L_2}\oint_{L_1}\frac{d\bar{L}_2 \times (d\bar{L}_1 \times \bar{a}_{R_{12}})}{R_{12}^2}$.	02+03	05
8	$\oint \bar{B}\cdot d\bar{S} = 0$. $B_{N_1} = B_{N_2}$. $\frac{H_{N_1}}{H_{N_2}} = \frac{\mu_2}{\mu_1} = \frac{\mu_{r2}}{\mu_{r1}}$ $\frac{B_{tan1}}{B_{tan2}} = \frac{\mu_1}{\mu_2} = \frac{\mu_{r1}}{\mu_{r2}}$. $\oint \bar{H}\cdot d\bar{l} = I$. $\bar{H}_{tan_2} - \bar{H}_{tan_2} = \bar{K}_{N_2}\times\bar{K}$.	05 05	10

Staff

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Question No.	Details of the Answer	Marks Distribution	Total Marks
9.	motional e.m.f : $e = -\frac{d}{dt}\int_S \bar{B}\cdot d\bar{s}$ $e = \oint \bar{E}\cdot d\bar{l}$ $= -\frac{d}{dt}\int \bar{B}\cdot d\bar{s}$ statically induced e.m.f $\oint \bar{E}\cdot d\bar{l} = -\int \frac{\partial \bar{B}}{\partial t}\cdot d\bar{s}$  $\oint_S (\nabla\times\bar{E})\cdot d\bar{s} = -\int_S \frac{\partial \bar{B}}{\partial t}\cdot ds$ $\nabla\times\bar{E} = -\frac{\partial \bar{B}}{\partial t}$ $\oint \bar{E}\cdot d\bar{l} = 0$! $\nabla\times\bar{E} = 0$.	05 05	10
10	Point form — Integral form $\nabla\times\bar{E} = -\frac{\partial \bar{B}}{\partial t}$ — $\oint \bar{E}\cdot d\bar{l} = -\int \frac{\partial \bar{B}}{\partial t}\cdot d\bar{s}$ $\nabla\times\bar{H} = \bar{J} + \frac{\partial \bar{D}}{\partial t}$ — $\oint \bar{H}\cdot d\bar{l} = I + \int_S \frac{\partial \bar{D}}{\partial t}\cdot d\bar{s}$ $\nabla\cdot\bar{D} = \rho_v$ — $\oint \bar{D}\cdot d\bar{s} = \int_S \rho_v\, dv$. $\nabla\cdot\bar{B} = 0$ — $\oint \bar{B}\cdot d\bar{l} = 0$.	5 +5	10

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Staff

HOD

CITYENGINEERING COLLEGE

Kanakapura Road, Doddakallasandra, Bengaluru - 560062

Electromagnetic waves(18EC55)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

QuestionBank#1

1.State and explain coulomb's law in complete vector form.

2.Determine electric field intensity due to infinite line charges

3.A uniform line charge ρ_l= 25 nC /m lies on the line X=-3m, Z=4 m in free space .Find the electric field intensity at a point (2, 15, 3) m.

4.A point charge Q=30nC is located at the origin in Cartesian coordinates. Find the electric flux density and electric field intensity at (1, 3,-4) m.

5.It is required to hold four equal point charges each in equilibrium at the corners of a square.find the point charge which will do this, if placed at the centroid of the square.

6. Which are the various types of charge distributions? Explain. State the units of line charge density, surgace charge density and volume charge density.

7.Two particles having charges 2nc & 5nc are separated 0.5m apart. Determine the E at a point 'A' situated at a distance of 0.3m from 2nc & 0.4m from charge 5nc. Assume the dielectric constant of medium to be 5.

8.Define electric field intensity; obtain an expression for total electric field intensity at a point due to infinite number of point charge.

9.Explain i) Volume charge density (ii) Surface charge density (iii) Line charge density with mathematical expressions with respect to electrostatics.

10.Determine electric field intensity at a point due to infinite sheet of charge.

11. (a) Explain Gaussian surface with examples.
(b) What is electric flux? Explain the concept of electric flux density.
(c) Derive the relation between D&E.

12.Obtain an expression for total force at a point due to 'n' number of finite point charges.

13. Derive an expression for electric field at a point on the axis of the circular ring.

14.Volume charge density is given by

$$\rho_v = 10\, e^{-1000r}\, e^{-100z}\ (C/M^3)$$

Find the total charge in the region $0 \le r \le 0.01$ & $0 \le \Phi \le 2\pi$ & $0 \le z \le 0.01$m

15. Define Electric flux Density 'D'. Find the D at P(6, 8, -10) caused by
i) a point charge of 30 mC at origin.
ii) a uniform line charge of ρl = 40 μC/m on z-axis.
iii) A uniform surface charge of density ρs = 57.2 μC/m2 on the plane x =9.

16.Point charges of 50nc each are located at A(1,0,0) B(-1,0,0), C(0,-1,0) and D(0,-1,0)m. Find the total force on a charge at A and also find Electric Field Intensity.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITYENGINEERING COLLEGE

Kanakapura Road, Doddakallasandra, Bengaluru - 560062

Electromagnetic waves(18EC55)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

QuestionBank#2

1.Find field due to a uniformly charged spherical shell using gauss's law &draw variation of |E| w.r.t r.

2.(a).Starting from the Gauss's law as applied to the differential volume element, explain the concept of divergence.

3.Derive the expression for D due to the infinite sheet of charge placed in Z=0 plane, using Gauss' law.

4.(a).Define divergence & its physical meaning.

(b) .State & prove Gauss's law.

5. In a certain region of space Ð=2xy $\hat{a}_x$+3yz $b_y\hat{}$+4zx $\hat{c}_z$.Evaluate the amount of electrical flux that passes through the portion bounded by -1≤ y <2, 0≤ y <4 in the x=3 plane using Gauss' law.

6.(a).State &prove Gauss' Divergence theorem.

(b).Let Ð = $(2y^2z-8xy)\ \hat{a}_x + (4xyz-4x^2)\ b_y\hat{} + (2xy^2-4z)\ \hat{c}_z$.Determine the total charge with in a volume of 10^{-14} m^3 located at P (1,-2, 3).

7.Two uniform line charges of density **8 nC/m** are located in a plane **y = 0 at x = +4m & x=- 4m**. Find 'E' at **P (0, 4, 10) m**.

8.Define Electric flux Density **'D'**. Find the **D** at **P(6, 8, -10)** caused by

i) a point charge of **30 mC** at origin.

ii) a uniform line charge of **ρl = 40 µC/m** on z-axis.

iii) A uniform surface charge of density **ρs = 57.2 µC/m2** on the plane **x =9.**

9.(a) define potential difference and absolute potential.

(b) Establish the relation $\bar{E} = -\nabla V$.

10. (a) Derive Maxwell's first equation in electrostatics.

(b) Derive an expression for potential due to a point charge.

11. Verify both sides of Guass- divergence theorem if $\bar{D} = 2xy\widehat{a_x} + x^2\widehat{a_y}$ C/m^2 present in the region bounded by 0≤ x ≤ 1, 0≤ y ≤ 2, 0≤ z ≤ 3.

12. (a) Given $\bar{D} = 10cos\theta sin\phi/r\ \widehat{a_r}$ C/m^2, determine the volume charge density.

(b) Explain Divergence theorem.

13. Obtain an expression for the energy expended in moving a point charge in an electric field.

14. Calculate the work done in moving a 4C charge from B(1,0,0) to A (0,2,0) along the path y=2-2x, z=0 in the field E: i)$5a_x$V/m ii)$5xa_x$ V/m

15. Calculate the divergence of vector D at the points specified using Cartesian and Cylindrical coordinates:

1. $\vec{D} = \frac{1}{z^2}[10xyz.a_x + 5x^2z.a_y + (2z^3 - 5x^2y)a_z]$ c/m^2 at point P(2,3,5)
2. $\vec{D} = 5z^2.a_r + 10rz.a_z$ at p(3, 45°,5)

16. Derive the expression for D due to the infinite line charge placed in Z axis plane, using Gauss' law.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITYENGINEERING COLLEGE

Kanakapura Road, Doddakallasandra, Bengaluru - 560062

Electromagnetic waves(18EC55)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CBSC SCHEME

QUESTION BANK#3

Time varying fields and Maxwell's equations

1. Explain the following (a) motional e.m.f (b) transformer e.m.f
2. Write maxwell's equation in point form & integral form.
3. Explain the concept of displacement current and displacement current density.
4. Find the frequency at which conduction current density & displacement current density are equal in a medium with $\sigma = 2x\ 10^{-4}$ V/M. & ε_r=81.
5. Write a short note on retarded potential.
6. Find the induced voltage in the conductor if $\overline{B} = 0.04\,\widehat{a_y}, T$ & $\overline{v} = 2.5sin10^3t\,\widehat{a_z}$. m/s .Find induced e.m.f if $\overline{B}$ is changed to $0.04\,\widehat{a_x}$.
7. Explain general field relations for time varying fields.
8. The Explain physical significance of displacement current and show that for harmonically varying fields the conduction and displacement currents are in time phase quadrature.
9. Given $\overline{E} = E_m sin(wt - \beta z)\widehat{a_y}$ in free space, find $\overline{D}$, $\overline{B}$, & $\overline{H}$, sketch $\overline{E}$ & & $\overline{H}$,

Uniform plane waves

10. Derive the general wave equation using Maxwell's equation.
11. Derive the wave equation for a uniform plane wave.
12. Obtain solution for a uniform plane wave in an isotropic homogeneous dielectric medium.
13. Define intrinsic impedance for free space, what are the values of intrinsic impedance & velocity if propagation?.
14. What is skin effect?. What is skin depth? What is its relation with attenuation constant, conductivity & frequency.
15. State poynting theorem. & derive the point & integral form of the poynting.
16. Discuss uniform plane wave propagating in a good conducting media.
17. The $\vec{H}$ field in free space is given by $\vec{H}(x,t) = 10cos(10^8t - \beta x)\widehat{a_y}$ A/m. Find β, λ and $\vec{E}(x,t)$ at P(0.1,0.2,0.3) and t=1ns.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY
ENGINEERING COLLEGE
Doddakallasandra, Bangalore-560061

CIRCULAR

Ref No: CEC/ME/DAC/ACY 2021-2022/01 Date: 29-09-2021

This is to inform the members of Department Advisory Committee that meeting is scheduled on 29-09-2021at 10: 00 AM in ME department.

Agenda:

- Planning of Internships & Project work for 7th semester students.
- Involving students in technical activities.
- Planning for stock verification of labs.
- Conducting workshop/seminar/guest lectures.
- Planning to improve result of students.
- Planning to conduct value added course for student.
- Planning of Course preference, Course allocation & Work load distribution for upcoming odd semester.

Dr.S.Karunakara

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE
Doddakallasandra, Bangalore-560061

DEPARTMENT OF MECHANICAL ENGINEERING

Department Advisory Committee Meeting

Date: 29/09/2021
Time: 10:00 AM
Venue: ME Department

DAC Members Present:

Sl. No	Member Name	Designation	Role
1	Dr. S KARUNAKARA	HOD	Convenor
2	Dr. UMA T R	Professor	Member
3	HARSHA VARDHAN U	Professor	Co-Convenor
4	ANIL KUMAR R	Assistant Professor	Member
5	SHRUTI NAIK	Assistant Professor	Member
6	VIJAY KUMAR	Assistant Professor	Member
7	SAMPATH H P	Assistant Professor	Member
8	RAKESH Y D	Assistant Professor	Member
9	SHIVARAJA H B	Assistant Professor	Co-Convenor
10	Srinivas Bangale	Production Engineer	Alumni

The Department Advisory Committee meeting was conducted at Department of ME, on 29th September, 2021, at 10 AM.

Agenda of the Meeting:

- Planning of Internships & Project work for 7th semester students.
- Involving students in technical activities.
- Planning for stock verification of labs.
- Conducting workshop/seminar/guest lectures.
- Planning to improve result of students.
- Planning to conduct value added course for student.
- Planning of Course preference, Course allocation & Work load distribution for upcoming odd semester.

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty accomplishments and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The HOD welcomed all the staff for the meeting. The following points were discussed as follows.

- The stock verification has to be completed by the staff members who are in-charge of lab during 2020-21 and hand over to staff members who are in-charge of lab during 2021-22.
- It was proposed to conduct a workshop, seminars & guest lecture on recent trending topics.
- The staff members were informed to conduct classes and labs regularly, to timely conduct and complete the entrusted responsibility, to actively participate in the dept and college activities and finally to take suitable actions for getting results and admissions to the dept.
- The guide has to check and discuss about the internship practice taken by students of 7th semester allocated to him or she. The guide must visit the site where internship is practiced by the students and discuss with supervisor of students at the site.
- The staff members should complete all the five modules and work hard to get 100% pass percentage. The staff members should find out the reasons for poor percentage in the concerned subject and submit report.
- Valuation data has to be submitted by all the faculties who involved in valuation.

HOD thanked all the staff for having attended the meeting.

Dr.S.Karunakara

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

ACADEMIC YEAR:2021-22 (ODD)

Department of Mechanical Engineering

COURSE PREFERENCE

Name of the Faculty: Mr. Rakesh. Y. D

Designation: Assistant professor.

Sl. No	Course Code and Name	Year/Semester
1	18ME741 – Additive Manufacturing	IV / VII
2.	18ME51 – M&E	III / V
3.	18EUDL15 – EVN	I / I

Signature of Faculty

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

ACADEMIC YEAR:2021-22 (ODD)

Department of Mechanical Engineering

COURSE PREFERENCE

Name of the Faculty: Mr. Sampath. H.P

Designation: Assistant professor.

Sl. No	Course Code and Name	Year/Semester
1	18ME52 – DOM	III \ V
2.	18ME54 – DMB-1	III \ V
3.	18ME34 – MOM	II \ III

Signature of Faculty

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

ACADEMIC YEAR: 2021-22(ODD)

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE ALLOCATION

Sl.No	Name of the Faculty	Course Code and Name	Year/ Semester	Signature
1	Dr. S Karunakara	18ME51, 18ME754	V, VII	
2	Dr. Uma T R	18ME73, 18ME754	VII, VII	
3	Harsha Vardhan U	18ME34, 18ME51	III, V	
4	Anil Kumar R	18ME32, BCSCK104D	III, I	
5	Shruti Naik	18ME35, BCEDK103	III, I	
6	Vijay Kumar	18ME34, 18ME54	III, V	
7	Sampath H P	18ME31, 18ME71	III,VII	
8	Rakesh Y D	18ME72, 18ME33, BCSCK104D	VII, III, I	
9	Shivaraja H B	18ME31, BCEDK103	III, I	

HOD

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING

ODD 2021-2022 TIME TABLE

SEMESTER: III ME 'A' SEC CBCS **2018 SCHEME** **CLASS ROOM: A307**

DAY	9:00 - 10:00 AM	10:00 - 11:00 AM	11:00 - 11:15 AM	11:15 AM - 12:15 PM	12:15 PM - 1:15 PM	LUNCH	2:00 – 3:00 PM	3:00 – 4:00 PM	4:00 – 5:00 PM
MON	18MAT31	18ME35	*BREAK*	18ME32	18ME35	*LUNCH*	18ME34	18ME35	
TUE	18ME36B	18ME32		18MAT31	18ME36B		18MEL37B		
WED	18ME35	18ME33		18MAT31	18ME32		18ME35	18ME33	
THU	18ME34	18MAT31		18ME33	18ME32		18MEL38B		
FRI	18ME33	18ME34		18ME36B	18ME36B				
SAT	NSS/SPORTS/YOGA BNSK359/BPEK359/BYOK359			NSS/SPORTS/YOGA BNSK359/BPEK359/BYOK359					

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
18MAT31	Transform calculus, fourier series and Numerical techniques	Prof Vanitha G R
18ME32	Metal Casting, Forming & Joining process	Prof Anil Kumar R
18ME33	Material Science and Engineering	Prof Rakesh Y D
18ME34	Basic Thermodynamics	Prof Harshavardhan U
18ME35B	Metal cutting and forming	Dr Uma T R
18ME36B	Mechanical Measurements and Metrology	Prof Shruti Naik
18MEL37B	Mechanical Measurements and Metrology lab	Prof Shruti Naik
18MEL38B	Foundry, Forging and Welding lab	Prof Anil Kumar

HOD, Dept. of ME

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING

ODD 2021-2022 TIME TABLE

SEMESTER: V ME 'A' SEC CBCS **2018 SCHEME** **CLASS ROOM: A306**

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 AM 10:00 AM	10:00AM 11:00 AM	11:00 AM 11:15AM	11:15 AM 12:15 PM	12:15 PM 1:15 PM	1:15 PM 2:00 PM	2:00 PM 3:00 PM	3:00 PM 4:00 PM	4:00 PM 5:00 PM
MON	18ME51	18ME55		18ME55	18ME54		18MEL55		
TUE	18ME53	18ME54		18ME56	18ME52		18ME53	18ME56	
WED	18ME55	18ME56	*BREAK*	18ME52	18ME54	*LUNCH*	18ME55	18ME51	
THU	18ME52	18ME53		18ME52	18ME54				
FRI	18ME52	18MEL581		18MEL53	18ME51				
SAT	NSS/SPORTS/YOGA *BNSK359/BPEK359/BYOK359*			NSS/SPORTS/YOGA *BNSK359/BPEK359/BYOK359*					

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
18ME51	Management & Economics	Prof Shruti Naik
18ME52	Design of Machine Elements I	Prof Sampath H P
18ME53	Dynamics of Machines	Veeresh Naik
18ME54	Turbo Machines	Prof Vijay Kumar
18ME55	Fluid Power Engineering	Prof Anil Kumar
18ME56	Operations Management	Dr Uma T R
18MEL57	Fluid Mechanics Lab	Prof Harshavardhan U
18MEL58	Energy Conversion Lab	Prof Sampath H P

HOD, Dept. of ME

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING

ODD 2021-2022 TIME TABLE

SEMESTER: VII ME 'A' SEC CBCS **2018 SCHEME** **CLASS ROOM: A305**

DAY	9:00-10:00 AM	10:00-11:00 AM	11:00-11:15 AM	11:15-12:15 PM	12:15-1:15 PM	1:15-2:00 PM	2:00-3:00 PM	3:00-4:00 PM	4:00-5:00 PM
MON	18ME71	18ME754	*BREAK*	18ME72	18ME741	*LUNCH*	DESIGN LAB		
TUE	18ME72	18ME71		18ME73	18ME754		MAJOR PROJECT PHASE-I		
WED	18ME73	18ME72		18ME754	18ME741		18ME754	18ME73	
THU	18ME741	18ME71		18ME72	18ME73				
FRI	CIM LAB			18ME71	18ME741		DEPARTMENT ACTIVITY		
SAT	NSS/SPORTS/YOGA BNSK359/BPEK359/BYOK359			NSS/SPORTS/YOGA BNSK359/BPEK359/BYOK359					

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
18ME71	Control Engineering	Dr. Uma T R
18ME72	CAD/CAM	Prof Rakesh Y D
18ME734	Total Quality Management	Shruti Naik
18ME741	Additive Manufacturing	Prof Anil Kumar
18ME754	Non-Conventional Energy Resources	Dr. S Karunakara
18MEL76	CIM LAB	Prof Shruti Naik
18MEL77	DESIGN LAB	Prof Sampath H P
18MEP78	PROJECT PHASE I	Prof Harshavardhan U

HOD, Dept. of ME

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2021-22 (ODD SEM)

DAY	Date	OCTOBER	Date	NOVEMBER	Date	DECEMBER	Date	JANUARY	Date	FEBRUARY
FRI	1	STARTING OF 5th & 7th Semesters								
SAT	2	GANDHI JAYANTI(DH)					1			
SUN	3						2		1	
MON	4		1	KANNADA RAJYOTSAVA(DH)			3		2	
TUE	5		2				4		3	VTU PracticalExams 01.02.2022 To 10.02.2022 5th & 7th Semesters
WED	6	MAHALAYA AMAVASYA(DH)	3	NARAKA CHATURDASHI(DH)	1		5		4	
THU	7		4		2		6		5	
FRI	8		5	DEEPAVALI(DH)	3		7		6	
SAT	9	2ND SATURDAY HOLIDAY	6		4		8	2ND SATURDAY HOLIDAY	7	
SUN	10		7		5		9		8	THIRD INTERNAL ASSESSMENT For 3rd sem
MON	11		8		6	SECOND INTERNAL ASSESSMENT 5th & 7th Semesters	10	THIRD INTERNAL ASSESSMENT 5th & 7th Semesters	9	
TUE	12		9	FIRST INTERNAL ASSESSMENT 5th & 7th Semesters	7		11		10	
WED	13		10		8		12		11	Last Working day of 3rdSemester 19.02.2022
THU	14	AYUDHA PUJA(DH)	11		9		13		12	
FRI	15	VIJAYA DASHAMI(DH)	12		10		14		13	
SAT	16		13	2ND SATURDAY HOLIDAY	11	2ND SATURDAY HOLIDAY	15		14	
SUN	17		14		12		16		15	
MON	18	STARTING OF 3rd Semester	15		13		17		16	
TUE	19	Id Meelad(DH)	16		14		18		17	VTU Theory Exams for 5th & 7th Semesters 11.02.2022 To 25.03.2022
WED	20	VALMIKI JAYANTHI(DH)	17		15		19		18	
THU	21		18		16		20		19	
FRI	22		19		17		21		20	VTU Practical Exams For 3rd sem 21.02.2022 To 04.03.2022
SAT	23	4TH SATURDAY HOLIDAY	20	ALUMNI MEET & GRADUATION DAY	18		22	4TH SATURDAY HOLIDAY	21	
SUN	24		21		19		23		22	
MON	25		22	KANAKA JAYANTHI(DH)	20		24		23	
TUE	26		23		21		25		24	VTU Theory Exams for 3rd sem 07.03.2022 To 25.03.2022
WED	27		24		22		26		25	
THU	28		25		23		27		26	
FRI	29		26		24		28		27	
SAT	30		27	4TH SATURDAY HOLIDAY	25	4TH SATURDAY HOLIDAY	29		28	Commencement of EVEN Semester for 6th & 8th sem is 04.04.2022 and For 4th sem is 11.04.2022
SUN	31		28	FIRST INTERNAL ASSESSMENT 3rd Semester	26	SECOND INTERNAL ASSESSMENT 3rd Semester	30			
MON			29		27		31	Last Working day of 5th & 7th Sem		
TUE			30		28					
WED					29					
THU					30					
FRI					31					

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

City Engineering College

Department of Mechanical Engineering

Individual Time Table

Dr. KARUNAKARA S

TIME / DAY	9:00am To 10:00am	10:00am To 11:00am	11:00am To 11:15am	11:15am To 12:15pm	12:15pm To 1:15pm	1:15m To 2:00pm	2:00pm To 3:00pm	3:00pm To 4:00pm	4:00pm To 5:00pm
MON			TEA BREAK	18EDGL15		LUNCH	18ME754		
TUE	18ME741			118ME741					
WED									
THU	18ME741				18ME51				
FRI				18ME741					
SAT									

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Updated on 16.04.2020/28092020

B. E. MECHANICAL ENGINEERING Choice Based Credit System (CBCS) and Outcome Based Education (OBE) SEMESTER – VII Professional Elective 3			
ADDITIVE MANUFACTURING			
Course Code	**18ME741**	CIE Marks	40
Teaching Hours /Week (L:T:P)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:

- To know the principle methods, areas of usage, possibilities and limitations of the Additive Manufacturing technologies.
- To be familiar with the characteristics of the different materials those are used in Additive Manufacturing.
- To know the principles of polymerization and powder metallurgy process, extrusion-based system printing processes, sheet lamination processes, beam deposition processes, direct write technologies and Direct Digital Manufacturing.
- To get exposed to process selection, software issues and post processing.

Module-1

Introduction and basic principles: Need for Additive Manufacturing, Generic AM process, stereoli tho graphy or 3dprinting, rapid proto typing ,the benefits of AM, distinction between AM and CNC machining, other related technologies- reverse engineering technology.

Development of Additive Manufacturing Technology: Introduction, computers, computer-aidedde sign technology ,other associated technologies, the use of layers, classification of AM processes, metals ystems, hybrid systems, milestones in AM development.

Additive Manufacturing Process chain: Introduction, the eight steps in additive manufacture, variations from one AM machine to another ,metal systems, maintenance of equipment, materials handling issues, design for AM, and application areas.

Module-2

Photo polymerization processes: Stereolitho graphy (SL), Materials, SL resin curing process, Micro-stereoli thography, Process Benefits and Drawbacks, Applications of Photo polymerization Processes.

Powder bedfusion processes: Introduction, Selective laser Sintering (SLS), Materials, Powder fusion mechanism, SLS Metal and ceramic part creation, Electron Beam melting (EBM), Process Benefits and Drawbacks, Applications of Powder Bed Fusion Processes.

Extrusion-based systems: Fused Deposition Modelling (FDM), Principles, Materials, Plotting and path control, Bio-Extrusion, Process Benefits and Drawbacks, Applications of Extrusion-Based Processes.

Module-3

Printing Processes: evolution of printing as an additive manufacturing process, research achievements in printing deposition, technical challenges of printing, printing process modeling, material modification methods, three-dimensional printing, advantages of binder printing

Sheet Lamination Processes: Materials, Laminated Object Manufacturing (LOM), Ultrasonic Consolidation (UC), Gluing, Thermal bonding, LOM and UC applications.

Beam Deposition Processes: introduction, general beam deposition process, description material delivery, BD systems , process parameters, typical materials and microstructure, processing–structure–properties relationships, BD benefits and drawbacks.

Direct Write Technologies: Background ,ink -basedDW,laser transfer, DW thermals pray,DW beam deposition,DW liquid-phase directde position.

Module-4

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Guidelines for Process Selection: Introduction, selection methods for apart, challenges of selection, example system for preliminary selection, production planning and control.
Software issues for Additive Manufacturing: Introduction, preparation of cad models – the STL file, problems with STL files, STL file manipulation.
Post- Processing: Support material removal, surface texture improvements, preparation for use as a pattern, property enhancements using non-thermal techniques and thermal techniques.

Module-5

The use of multiple materials in additive manufacturing: Introduction, multiple material approaches, discrete multiple material processes, porous multiple material processes, blended multiple material processes, commercial applications using multiple materials, future directions.
AM Applications: Functional models, Pattern for investment and vacuum casting, Medical models, art models, Engineering analysis models, Rapid tooling, new materials development, Bi-metallic parts, Re-manufacturing. Application: Examples for Aerospace, defense, automobile, Bio-medical and general engineering industries.
Direct digital manufacturing: Align Technology, siemens and phonak, DDM drivers, manufacturing vs. prototyping, life- cycle costing, future of direct digital manufacturing.

Course Outcomes: At the end of the course the student will be able to:

CO1: Demonstrate the knowledge of the broad range of AM processes, devices, capabilities and materials that are available.
CO2: Demonstrate the knowledge of the broad range of AM processes, devices, capabilities and materials that are available.
CO3: Understand the various software tools, processes and techniques that enable advanced/additive manufacturing.
CO4: Apply the concepts of additive manufacturing to design and create components that satisfy product development/prototyping requirements, using advanced/additive manufacturing devices and processes.
CO6: Understand characterization techniques in additive manufacturing.
CO7: Understand the latest trends and business opportunities in additive manufacturing.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks.
- Each full question will be for 20 marks.
- There will be two full questions (with a maximum of four sub- questions) from each module.
- Each full question will have sub- question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl. No.	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	Additive Manufacturing Technologies Rapid Prototyping to Direct Digital Manufacturing	I. Gibson I D. W. Rosen I B. Stucker	Springer New York Heidelberg Dordrecht, London	ISBN: 978-1-4419-1119-3 e-ISBN: 978-1-4419-1120-9 DOI 10.1007/978-1-4419-1120-9
Reference Books				
1	"Rapid Prototyping: Principles & Applications	Chua Chee Kai, Leong Kah Fai	World Scientific	2003
2	Rapid Prototyping: Theory & Practice	Ali K. Kamrani,	Springer	2006

ATTESTED COPY
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

ENERGY ENGINEERING
B.E, VII Semester, Mechanical Engineering
[As per Choice Based Credit System (CBCS) scheme]

Course Code	**17ME71**	**CIE Marks**	**40**
Number of Lecture Hours/Week	**03+02**	**SEE Marks**	**60**
Total Number of Lecture Hours	**50(10 Hours per Module)**	**Exam Hours**	**03**

Credits – 04

Course Objectives:

- **Understand energy scenario,energy sources and their utilization**
- **Learn about energy conversion methods and their analysis**
- **Study the principles of renewable energy conversion systems**
- **Understand the concept of green energy and zero energy.**

Module - 1

Thermal Energy conversion system: Review of energy scenario in India,General Philosophy and need of Energy ,Different Types of Fuels used for steam generation,Equipment for burning coal in lump form, strokers, different types, Oilburners, Advantages and Disadvantages of using pulverized fuel, Equipmentfor preparation and burning of pulverized coal, unit system and bin system.Pulverized fuel furnaces, cyclone furnace, Coal and ash handling, Generationof steam using forced circulation, high and supercritical pressures.Chimneys: Natural, forced, induced and balanced draft, Calculations andnumerical involving height of chimney to produce a given draft. Coolingtowers and Ponds. Accessories for the Steam generators such asSuperheaters, De-superheater, control of superheaters, Economizers, Air preheatersand re-heaters.

Module - 2

Diesel Engine Power System: Applications of Diesel Engines in Power field.Method of starting Diesel engines. Auxiliaries like cooling and lubricationsystem, filters, centrifuges, Oil heaters, intake and exhaust system, Layout ofdiesel power plant.
Hydro-Electric Energy: Hydrographs, flow duration and mass curves, unithydrograph and numerical. Storage and pondage, pumped storage plants, low, medium and high head plants, Penstock, water hammer, surge tanks,gates and valves. General layout of hydel power plants.

Module - 3

Solar Energy: Fundamentals; Solar Radiation; Estimation of solar radiation on horizontal and inclined surfaces; Measurement of solar radiation data, Solar Thermal systems: Introduction; Basics of thermodynamics and heat transfer; Flat plate collector; Evacuated Tubular Collector; Solar air collector; Solar concentrator; Solar distillation; Solar cooker; Solar refrigeration and air conditioning; Thermal energy storage systems, Solar Photovoltaic systems: Introduction; Solar cell Fundamentals; Characteristics and classification; Solar cell: Module, panel and Array construction; Photovoltaic thermal systems

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Module - 4
Wind Energy: Properties of wind, availability of wind energy in India, windvelocity and power from wind; major problems associated with wind power,wind machines; Types of wind machines and their characteristics, horizontal land vertical axis wind mills, coefficient of performance of a wind mill rotor(Numerical Examples). **Tidal Power**: Tides and waves as energy suppliers and their mechanics;fundamental characteristics of tidal power, harnessing tidal energy, Limitations.
Module - 5
Biomass Energy: Introduction; Photosynthesis Process; Biofuels; Biomass Resources; Biomass conversion technologies; Urban waste to energy conversion; Biomass gasification. **Green Energy**: Introduction: Fuel cells: Overview; Classification of fuel cells; Operating principles; Fuel cell thermodynamics Nuclear, ocean, MHD, thermoelectric and geothermal energy applications; Origin and their types; Working principles, Zero energy Concepts .
Course outcomes: 1. **Summarize the basic concepts of thermal energy systems,** 2. **Identify renewable energy sources and their utilization.** 3. **Understand the basic concepts of solar radiation and analyze the working of solar PV and thermal systems.** 4. **Understand principles of energy conversion from alternate sources including wind, geothermal, ocean, biomass, biogas.** 5. **Understand the concepts and applications of fuel cells, thermoelectric convertor and MHD generator.** 6. **Identify methods of energy storage for specific applications**
TEXT BOOKS: 1. B H Khan, Non conventional energy resources, 3rd Edition, McGraw Hill Education 2. Principles of Energy conversion, A. W. Culp Jr., McGraw Hill. 1996
REFERENCE BOOKS 1. S.P. Sukhatme, Solar Energy: principles of Thermal Collection and Storage, Tata McGraw-Hill (1984). 2. C. S. Solanki, "Solar Photovoltaic's: Fundamental Applications and Technologies, Prentice Hall of India, 2009. 3. L.L. Freris, Wind Energy Conversion Systems, Prentice Hall, 1990.

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN

COURSE CODE: 17ME71

CITY ENGINEERING COLLEGE
BANGALORE – 62
FIRST INTERNAL ASSESSMENT

PROGRAMME: MECHANICAL ENGINEERING
COURSE NAME: ENERGY ENGINEERING
SEM: VII
Duration: 1.30 Hrs

DATE: 24/02/2022
TIME: 10.30-12.00

MAX MARKS: 50

Note: Answer any FIVE questions choosing atleast one from each Part.

Sl.No	PART – A	Marks
1.	Explain the working principle of biomass energy	10
	OR	
2.	Explain fixed dome plant of biomass energy	10
	PART – B	
3.	Explain the principle of ocean thermal energy	1o
	OR	
4.	Discuss geothermal energy in detail	10
	PART-C	
5.	Explain biomass energy conversion concept	10
	OR	
6.	List down the advantages and disadvantages of GTE	10
	PART-D	
7.	Discuss the process principle of nuclear energy	10
	OR	
8.	List down the advantages and disadvantages of nuclear energy	10
	PART-E	
9.	Describe in detail about fuel cell	10
	OR	
10.	Explain zero energy concepts	10

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERIN COLLEGE

DEPARTMENT OF ..M.E.....

SCHEME FOR VALUATION Energy Engg.

Semester & Section: 7th **Internal Test** 3rd **Date:**

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	Principle of Biomass Sketch Explanation	2 3 5	10
2.	Fixed dome Sketch Explanation	4 6	10
3.	OCEAN thermal energy principle Explanation	4 6	10
4.	Geothermal energy Sketch Explanation	4 6	10
5.	Biomass Engy Conversion Explanation	4 6	10

Staff S. kavan

HOD S. kavan

ATTESTED COPY

skavan

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Question No.	Details of the Answer	Marks Distribution	Total Marks
6.	Advantage / Disadvantage GTE	5+5	10
7.	Nuclear Energy process principle working	5 5	10
8	Advantage / Disadvantage of Nuclear Energy	5+5	10
9	Fuel cell principle. Detail Explanation	4 6	10
10	Zero Energy concept	10	10

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN | | | | | | | | | |

COURSE CODE: 17ME71

CITY ENGINEERING COLLEGE
BANGALORE – 62
SECOND INTERNAL ASSESSMENT

PROGRAMME: MECHANICAL ENGINEERING
COURSE NAME: ENERGY ENGINEERING
SEM: VII
Duration: 1.30 Hrs

DATE: 13/12/2021
TIME: 10.30-12.00

MAX MARKS: 50

Note: Answer any FIVE questions choosing atleast one from each Part.

Sl.No	PART – A	Marks
1.	With a neat sketch explain hydroelectric power generation	10
	OR	
2.	Classify hydro electric power plants	10
	PART – B	
3.	List down different types of surge tanks and explain any one.	1o
	OR	
4.	With a neat sketch explain working of solar power plant	10
	PART-C	
5.	Explain any two applications of solar energy	10
	OR	
6.	With a neat sketch explain horizontal wind axis Mill	10
	PART-D	
7.	With a neat sketch explain Vertical wind axis Mill	10
	OR	
8.	Explain in detail about any one lubrication system in diesel power plant	10
	PART-E	
9.	Discuss various factors affect the efficiency of wind mill	10
	OR	
10.	Describe about different hydro power plants installed in Karnataka and their capacity	10

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERIN COLLEGE

DEPARTMENT OF .....

SCHEME FOR VALUATION

Internal Test 2nd Energy. Engg.

Semester & Section: 7th Date:

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	Hydroelectric power generation Sketch Description	4 6	10
2.	Classification of hydroelectric power plant	3+3 +4	10
3.	Surge tanks types Explanation (1)	4 6	10
4.	Sloan power plant Sketch working	4 6	10
5.	Solar Energy two applications	2x5	10

Staff S. kavhan HOD S. kavhan

ATTESTED COPY
S kavhan
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Question No.	Details of the Answer	Marks Distribution	Total Marks
6.	horizontal wind axis mill sketch Explanation	4 6	10
7.	Vertical axis wind mill sketch Explanation	4 6	10
8.	Lubrication system sketch Description	4 6	10
9.	factors affecting efficiency (5)	5×2	10
10.	hydroelectric powerplants in karnataka/capacity	10	10

skaurav

skaurav

ATTESTED COPY

skaurav

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

USN | | | | | | | | | |

COURSE CODE: 18ME741

CITY ENGINEERING COLLEGE
BANGALORE – 62
FIRST INTERNAL ASSESSMENT

PROGRAMME: MECHANICAL ENGINEERING **DATE: 11/11/2021**
COURSE NAME: ADDITIVE MANUFACTURING **TIME: 10:30-12:00**
SEM: VII
Duration: 1.30 Hrs **MAX MARKS: 50**

Note: Answer any FIVE questions choosing atleast one from each Part.

Sl.No	PART – A	Marks
1.	What is additive manufacturing? List down the advantages, disadvantages and applications of additive manufacturing.	10
	OR	
2.	Describe the classification of additive manufacturing	10
	PART – B	
3.	Differentiate between CNC and additive Manufacturing	10
	OR	
4.	With a neat sketch explain sheet lamination process	10
	PART-C	
5.	Explain briefly about the steps involved in additive manufacturing	10
	OR	
6.	Briefly explain photo polymerization	10
	PART-D	
7.	With a neat sketch explain selective laser sintering	10
	OR	
8.	Describe evolution of printing	10
	PART-E	
9.	Write a note on technical challenges in additive manufacturing	10
	OR	
10.	Describe binder jet printing	10

ATTESTED COPY

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

CITY ENGINEERIN COLLEGE
DEPARTMENT OF ..Mechanical Engg.

SCHEME FOR VALUATION ADDITIVE MANUFACTURING

Semester & Section: 7th **Internal Test** 1st **Date:**

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	Explanation Add Manufacturing – Adv – Dis Adv – Appl	~~5~~ 2+2+3	10
2.	Classification Additive Manfac		10
3.	Diff b/w CNC / Additive Manfac atleast (5)	5+5	10
4.	All 7-8 steps involved in Additive manfac		10
5.	Sketch of Stereolithography – Explanation –	3 7	10
6.	Photopolymerization Sketch – Description	3 7	10

Staff S Kavhan

S. Kavhan
HOD

ATTESTED COPY
Skavhan
PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061

Question No.	Details of the Answer	Marks Distribution	Total Marks
7.	LASER Sintering Sketch – Description –	3 7	10
8.	printing history, importance evolution	3+3+4	10
9.	Technical challenges in Additive Manufact Attempt 4 presently faced	3+3+2+2	10
10.	Binder Jet Sketch Description	3 7	10

skaurav

ATTESTED COPY

skaurav

PRINCIPAL
CITY ENGINEERING COLLEGE
Kanakapura Main Road, Bangalore-560061