



TEERTHANKER MAHAVEER UNIVERSITY

(Established under Govt. of U. P. Act No. 30, 2008)

Delhi Road, Moradabad (U.P)

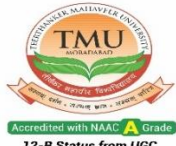
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COURSE FILE

Faculty of Engineering

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Course Name	:	Basic Electrical Engineering
Course Code	:	EEE117
Faculty Member	:	Dr. Shubhendra Pratap Singh
Program	:	B.Tech CSE
Semester	:	II
Academic Year	:	2024-25

	Index	SESSION-2024-2025
		SEM- Ist Subject: Basic Electrical Engineering Code: EEE117 Dept. /Sec: CSE

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FACULTY OF ENGINEERING
B.Tech. CSE NBA Accreditation 2025

INSTITUTE

VISION

To be recognised as institute of excellence, promoting value based education in computer science and engineering with multidisciplinary research, innovation and consultancy services to the society.

MISSION

1. To provide holistic education through outcome based learning.
2. To promote interdisciplinary learning and research for serving the needs of entire global community.
3. To inculcate innovation in graduates using technological advancements for the development of computational solutions.
4. To prepare graduates to be continuous learners by inculcating people skills.

DEPARTMENT

VISION

To be recognised as department of excellence, promoting value-based education in computer science and engineering with multidisciplinary research, innovation and consultancy services to the society.

MISSION

1. To provide value based education by implementing outcome-based teaching and learning process.
2. To promote inter-disciplinary research that for serving the needs of entire global community.
3. To inculcate desire for innovation in graduates using technological advancements for the development of effective solutions.
4. To prepare graduates as continuous learners by inculcating professional skills and ethical responsibilities.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

1. **Fundamental:** To prepare the graduates for career and proficiency in Computer Science and Engineering.
2. **Industry Ready:** To imbibe technical and aptitude skills related to Computer Science and Engineering to provide the best solution to industrial and societal problems.
3. **Continuous Learning:** To prepare graduates for pursuing higher education and life-long learning.
4. **Entrepreneurship Skills:** To imbibe entrepreneurship, leadership, effective communication and business skills through innovation, incubation and start-up activities.
5. **Social and Moral Ethics:** To develop awareness among the graduates about the various social responsibilities related to engineering ethics, human values and ecological understanding.

PROGRAM-SPECIFIC OUTCOMES (PSO)

PSO–1: Developing skills for creating computational solutions with emerging technologies, programming languages, mathematical foundations, algorithmic principles and open source platforms to solve complex engineering problems.

PSO–2: Understanding the evolutionary changes in computing by applying standard practices and skills acquired through computer engineering to provide solutions with innovative ideas and interdisciplinary research.

PSO–3: Applying modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur and pursue higher studies in their respective domains.

PROGRAM OUTCOMES FOR ENGINEERING:

PO – 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO – 2	Problem analysis& Solving: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO – 3	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.
PO – 4	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.
PO – 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO – 6	Social Interaction & effective citizenship: 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.
PO – 7	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.
PO – 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO – 9	Attitude (Individual and team work): Function effectively as an individual, and as member or leader in diverse teams, and in multidisciplinary settings.
PO – 10	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 clean instructions.
PO – 11	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.
PO – 12	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.

Academic Calendar



TEERTHANKER MAHAVEER UNIVERSITY

(Established under Govt. of U. P. Act No. 30, 2008)

Delhi Road, Moradabad (U.P)

E-Mail: registrar@tmu.ac.in

Phone No.: 9837933666

Email registrar@tmu.ac.in

Ref. No : TMU/R.O./2023-24/ Academic Calendar/02

Date: 28.06.2024

Circular

Subject: Academic Calendar Session 2024-25 (Except Medical & Dental).

The Academic Calendar of the University for various programmes [except for Medical & Dental programmes] is proposed, herewith. The calendar is suggestive and the dates mentioned may change depending upon the unforeseen situations that may arise owing to causes beyond control.

For Semester System

S. No.	Events/Particulars		Dates	
Odd Semester				
			For 1 st Year	For 2 nd Year Onwards
1	Course allocation and tagging on ERP for odd semester		July 15, 2024	July 15-20, 2024
2	Submission of time table and upload on ERP for odd Semester		July 25, 2024	
3	Upload of e-contents for odd semester on website		Up to July 31, 2024	
4	Commencement of classes	Nursing Programmes	August 01, 2024	August 01, 2024
		All other Programmes (Including Student Induction Program for 1-3 weeks, as applicable)	August 08, 2024	
5	Registration of semester course and open elective courses (if applicable) by the students	Nursing Programmes	August 01-05, 2024	August 08-12, 2024
		All other Programmes	August 08-30, 2024	
6	Sharing of Course Handouts with Students		August 30, 2024	
7	CT-I*	All Programmes and Programmes under NEP-2020 for batches admitted in session 2024-25	October 14-18, 2024	October 14-18, 2024
8	CT-II*	All Programmes except programmes under NEP-2020 for batches admitted in session 2024-25	November 18-22, 2024	November 18-22, 2024
9	End of odd semester Classes (For all programmes)		December 04, 2024	

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Evaluation Scheme

<u>Study & Evaluation Scheme</u>					
<u>SUMMARY</u>					
<i>Institute Name</i>		COLLEGE OF COMPUTING SCIENCES & INFORMATION TECHNOLOGY			
<i>Programme</i>		<i>Bachelor of Technology (Computer Science & Engineering)</i>			
<i>Duration</i>		<i>Four Years full time(Eight Semesters)</i>			
<i>Medium</i>		<i>English</i>			
<i>Minimum Required Attendance</i>		75%			
<u>Credits</u>					
<i>Minimum Credits Required for Degree</i>		186			
Assessment:					
Evaluation			Internal	External	Total
Theory			40	60	100
Practical/ Dissertations/ Project Reports/ Viva-Voce			50	50	100
Class Test-1	Class Test-2	Class Test-3	Assignment(s)	Attendance & Participation	Total
Best two out of three					
10	10	10	10	10	40
Duration of Examination			External	Internal	
			3 Hours	1.5 Hours	

To qualify the course a student is required to secure a minimum of 45% marks in aggregate including the semester end examination and teachers continuous evaluation.(i.e. both internal and external).A candidate who secures less than 45% of marks in a course shall be deemed to have failed in that course. The student should have at least 45% marks in aggregate to clear the semester.

Evaluation of practical course [From Second Year Onwards]

Practical Courses Internal Evaluation (50 marks)

TWO EXPERIMENTS	ATTENDANCE	VIVA	TOTALINTERNAL
30	10	10	50

Practical Courses External Evaluation (50 marks)

TWO EXPERIMENTS	FILE WORK	VIVA	TOTALINTERNAL
30	10	10	50

Class participation 10 % (regular basis) and attendance

Individual Assignment	10%	(after 20 sessions)
CT1 Exam	10 %	(Refer Academic Calendar)
CT2 Exam	10 %	(Refer Academic Calendar)
CT3 Exam	10 %	(Refer Academic Calendar)

Note: there is a consideration of best two CT's.

Syllabus

Basic Electrical Engineering

Course Code: EEE117

B. Tech- Semester-I

Course Outcomes:

On completion of the course, the students will be:

CO1. Understanding the basics of Network, AC Waveform and its characteristics.

CO2. Understanding the basic concept of Measuring Instruments, Transformers & three phase Power systems.

CO3. Understanding the basic concepts of Transformer.

CO4. Understanding the basic concept of power measurement using two wattmeter methods.

CO5. Applying the concept of Kirchhoff's laws and Network Theorems to analyze complex electrical circuits.

Course Content:

Unit-1:

Production of electricity in ancient India as compared to modern Indian Technology.

D.C. Network Theory: Passive, active, bilateral, unilateral, linear, nonlinear element, Circuit theory concepts-Mesh and node analysis; Voltage and current division, source transformation, Network Theorems-Superposition theorem, Thevenin's theorem, Norton's theorem, and Maximum Power Transfer theorem, Star-delta & delta-star conversion. **8 Hour**

Unit-2:

Steady State Analysis of A.C. Circuits: Sinusoidal and phasor representation of voltage and Current; Single phase A.C. circuit behavior of resistance, inductance and capacitance and their Combination in series & parallel; Power factor; Series and parallel resonance; Band width and Quality factor. **8 Hour**

Unit-3:

Basics of Measuring Instruments: Introduction to wattmeter & Energy meter extension range of voltmeter and ammeter.

Three Phase A.C. Circuits: Line and phase voltage/current relations; three phase power, power measurement using two wattmeter methods. **8 Hour**

Unit-4:

Single phase Transformer: Principle of operation; Types of construction; Phasor diagram; Equivalent circuit; Efficiency and losses. **8 Hour**

Unit-5:

Electrical machines:

DC machines: Principle & Construction, Types, EMF equation of generator and torque equation of motor, applications of DC motors (simple numerical problems). **8 Hour**

Text Books:

1. Nagrath I.J., Basic Electrical Engineering, Tata McGraw Hill

Reference Books:

1. Fitzgerald A.E & Higginbotham., D.E., Basic Electrical Engineering, McGraw Hill.
2. A Grabel, Basic Electrical Engineering, McGraw Hill.
3. Cotton H., Advanced Electrical Technology, Wheeler Publishing.
4. Del Toro, Principles of Electrical Engineering, Prentice-Hall International.
5. W.H. Hayt & J.E. Kemmerly, Engineering Circuit Analysis, McGraw Hill.

The Course Learning Outcomes (COs).

On completion of the course the participants will be able to:

CO1.	Understanding the basics of Network, AC Waveform and its characteristics.
CO2.	Understanding the basic concept of Measuring Instruments, Transformers & three phase Power systems.
CO3.	Understanding the basic concepts of Transformer.
CO4.	Understanding the basic concept of power measurement using two wattmeter methods.
CO5.	Applying the concept of Kirchhoff's laws and Network Theorems to analyze complex electrical circuits.

CO = Course Outcomes. (A student is expected to have learnt concepts and demonstrated/developed abilities or skills related to strategic management at the end of the course)

Alignment/Mapping of COs & POs (Course Articulation Matrix)

(a) CO Mapping with Assessment tools

Course Outcomes	CT-1	CT-2	CT-3	Assignment	Project Report	Semester End Theory Exam
CO1	√		√	✓	NA	✓
CO2	√		√	✓	NA	✓
CO3		√	√	✓	NA	✓
CO4		√	√	✓	NA	✓
CO5			√	✓	NA	✓

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1			1							2
CO2	3	1	1	1	2							2
CO3	3	1	1									1
CO4	3	2		2	2							1
CO5	3	3	2	2	2							2

(b) Mapping /Alignment of COs with POs (Programme Articulation Matrix)

CO	PSO1	PSO2	PSO3
CO1	1		
CO2	1		
CO3			
CO4	1		
CO5	2	1	

Justification of CO-PO Alignment Matrix

Course Name: Basic Electrical Engineering

Course Code: EEE117

PSO No	Program Objective	Course Outcome	Relevance	Justification
PO1	Engineering Knowledge	CO1	High	This CO involves fundamental concepts such as AC signal characteristics (frequency, phase, RMS values), which form the core of electrical engineering knowledge. These engineering principles are important to understand and analyze AC circuits and waveforms, a foundation for advanced topics.
		CO2	High	Understanding instrumentation and 3-phase systems directly uses engineering fundamentals such as electromagnetism, circuit theory, and power systems. These concepts are essential to electrical engineering knowledge and applications, forming the basis of system design and analysis.
		CO3	High	Transformers are studied through electromagnetic principles and core engineering laws like Faraday's and Lenz's laws. Expertise of these core concepts directly reflects strong engineering knowledge.
		CO4	High	The two-wattmeter method requires an understanding of 3-phase circuits, vector analysis, and power equations—all of which are rooted in engineering fundamentals. This reflects direct application of theoretical knowledge to practical engineering

				measurement.
		CO5	High	This CO demands application of core engineering laws (KVL, KCL, Thevenin's, Norton's, Superposition), requiring deep understanding of electrical theory and mathematical modeling. This is a direct implementation of engineering fundamentals for circuit analysis, justifying a high-level mapping.
PO2	Problem Analysis	CO1	Low	Although this CO involves understanding, students are expected to interpret and analyze AC waveforms (e.g., RMS, average value, phase shift), which requires application of first principles and basic analytical skills.
		CO2	Low	Some analysis is involved in interpreting measurement readings and understanding the behavior of three-phase systems under different loading conditions.
		CO3	Low	Basic conceptual understanding with less emphasis on complex problem analysis; mostly theoretical.
		CO4	Medium	Requires calculation and interpretation of power under various load conditions using two-wattmeter readings, which involves problem-solving.
		CO5	High	This CO focuses on solving complex circuit problems using fundamental laws and theorems (Thevenin, Norton, Superposition, etc.).
	Design/Develop	CO1		
		CO2	Low	Knowledge of these components is essential for system design, but this CO focuses on understanding rather than applying that knowledge to design a solution.
		CO3	Low	Although transformer knowledge is a prerequisite for design, this CO focuses mainly on conceptual understanding and limited for

PO3	ment of solutions			designing transformer-based systems.
		CO4		
		CO5	Medium	This CO involves analyzing and solving circuits—skills that are foundational for designing electrical networks and systems. It supports solution development but does not explicitly involve design tasks.
PO4	Conduct Investigations of Complex problems	CO1	-	
		CO2	Low	Measuring instruments can involve basic experimental observations and data interpretation. Still, investigation is not the focus.
		CO3		
		CO4	Medium	This CO involves experimental setup and interpretation of data in 3-phase systems, such as measuring power under different load conditions. It relates directly to conducting investigations.
		CO5	Medium	Involves using theoretical principles to analyze circuits; some lab experiments or simulations may be involved to validate solutions, aligning moderately with investigative processes.
PO5	Modern Tool Usage	CO1	Low	Students may use tools like oscilloscopes or simulation software (e.g., Multisim, PSpice) to visualize AC waveforms and measure parameters. However, this is not the core focus of the CO.
		CO2	Medium	This CO involves practical components where students may use modern measuring tools (e.g., digital multimeters, power analyzers) in labs or simulations.
		CO3		

		CO4	Medium	Often requires practical application using wattmeters or simulation tools to understand 3-phase power measurement, supporting tool-based analysis.
		CO5	Medium	Involves solving complex circuits where simulation tools (like MATLAB/Simulink or circuit simulators) can be used to analyze and verify theoretical results.
PO6	The Engineer and Society	CO1		
		CO2		
		CO3		
		CO4		
		CO5		
PO7	Environment and Sustainability	CO1		
		CO2		
		CO3		
		CO4		
		CO5		
PO8	Ethics	CO1		
		CO2		
		CO3		
		CO4		
		CO5		
PO9	Individual and Team Work	CO1		
		CO2		
		CO3		
		CO4		

		CO5		
PO10	Communication	CO1		
		CO2		
		CO3		
		CO4		
		CO5		
PO11	Project Management and Finance	CO1		
		CO2		
		CO3		
		CO4		
		CO5		
PO12	Life-Long Learning	CO1	Medium	This foundational knowledge builds a base for advanced study in electrical engineering (e.g., power systems, signal processing), supporting lifelong learning.
		CO2	Medium	Introduces key systems and tools essential for practical electrical engineering, enabling students to learn and adapt to future developments in the field.
		CO3	Low	Although theoretical, understanding transformer basics is essential for exploring advanced electrical machines and smart grids in later learning.
		CO4	Low	While useful in labs, this topic is narrow in scope. It doesn't strongly promote long-term learning, but forms part of an evolving domain.
		CO5	Medium	Strong alignment – these core analysis tools are crucial for further learning in any electrical

				engineering subdomain (e.g., electronics, communication, systems).
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PSO	Course Outcome	Relevance	Justification
PSO1	CO1	Low	This CO introduces fundamental AC waveform analysis, such as RMS, frequency, and phase. Students may use simulation software (like MATLAB, Scilab, or Python) to visualize and analyze these waveforms. Though direct programming is not emphasized, the foundation supports later computational modeling.
	CO2	Low	While this CO is theoretical, modern labs and simulations (e.g., with Multisim or Proteus) allow learners to engage with digital tools that mimic measuring instruments and power systems. This promotes familiarity with computational platforms and system-level thinking.
	CO3		
	CO4	Low	This CO has potential for simulation and analysis using tools that allow virtual measurements (e.g., MATLAB Simulink, PSpice). Students learn to interpret experimental values computationally, though it is not deeply algorithmic.
	CO5	Medium	This CO directly supports computational thinking. Students solve multi-loop/multi-node circuits using Kirchhoff's laws, Thevenin/Norton theorems, etc., which can be implemented and analyzed using programming languages or circuit simulation tools. It builds algorithmic reasoning essential for developing computational solutions.
PSO2	CO1		
	CO2		
	CO3		
	CO4		
	CO5	Low	This CO supports analytical problem-solving, which is foundational for interdisciplinary applications like embedded systems, circuit simulation, or hardware modeling. It indirectly supports research and

			innovation when built upon in advanced studies.
PSO3	CO1		
	CO2		
	CO3		
	CO4		
	CO5		

Designed By Subject Faculty:

Dr. Shubhendra Pratap Singh

Faculty Signature

Reviewed By:

Approved/ Not Approved					
Comments					
Role	Senior Subject Expert	Departmental SeniorFaculty	Departmental SeniorFaculty	Departmental SeniorFaculty	Other Department SeniorFaculty
Faculty Name					
Sig.with Date					

1 indicates the strength of correlation between CO and PO is Weak,

2 indicates the strength of correlation between CO and PO is Medium,

3 indicates the strength of correlation between CO and PO is High

LECTURE PLAN:

SN	Topics	Pedagogy	References	Session outcome (Bloom's Taxonomy)	Course Outcome (COs)
1.	D.C. Network Theory: Circuit theory concepts- Mesh and node analysis	Lecture & discussion	R1	L1,L2	CO1, CO5
2.	Network Theorems- Superposition theorem	Lecture & discussion	R2& R3	L1,L2 & L4	CO1, CO5
3.	Thevenin's theorem,	Lecture & discussion	R3	L1,L2, L3	CO1, CO5
4.	Norton's theorem	Lecture & discussion	R2& R3	L1,L2	CO1, CO5
5.	Maximum Power Transfer	Lecture & discussion	R2	L1,L2, L3	CO1, CO5
6.	Star Delta transformation	Lecture discussion,& Demonstrations	R2& R3	L1,L3,L4	CO1, CO5
7.	Star Delta transformation NT	Lecture & discussion	R2& R3	L1,L2	CO1, CO5
8.	Steady State Analysis of A.C. Circuits: Sinusoidal and phasor representation of voltage and current	Lecture, discussion & Demonstration	R2& R3	L1,L2,L3,L6	CO1, CO5
9.	Single phase A.C. circuit behaviour of resistance, inductance and capacitance and their combination in series & parallel	Lecture, discussion & Demonstration	R3	L1,L6	CO1, CO5
10.	Single phase A.C. circuit behaviour of resistance, inductance and capacitance and their combination in series & parallel	Lecture, discussion & Demonstration	R2& R3	L1, L2	CO1, CO5
11.	Single phase A.C. circuit behaviour of resistance, inductance and capacitance and their combination in series & parallel	Lecture, discussion & Demonstration	R2& R3	L1,L3	CO1, CO5
12.	Power factor	Lecture & discussion	R2& R3	L1,L2,L6	CO1, CO5

Remember, L2= Understand, L3= Apply, L4= Analyze, L5= Evaluate and L6= Create

13.	Series and parallel resonance;	Lecture, discussion & Demonstration	R2& R3	L1,L3,L6	CO1, CO5
14.	Band width and quality factor;	Lecture, discussion & Demonstration	R2& R3	L1,L2,L3	CO1, CO5
15.	Quality Factor	Lecture, discussion & Demonstration	R3	L1,L3	CO1, CO5
16.	Measuring Instruments: Construction and principles of operation of voltage and current measuring Instruments	Lecture & discussion	R3	L1,L2	CO2, CO4
17.	Classification of instruments, Different type of torque.	Lecture, discussion & Demonstration	R2	L1,L2,L5	CO2, CO4
18.	Introduction to voltmeter, ammeter, wattmeter, Energy meter	Lecture, discussion & Demonstration	R2 & R3	L1,L2,L3,L5	CO2, CO4
19.	Construction of Energy meter	Lecture, discussion & Demonstration	R2 & R3	L1,L2,L3,L5	CO2, CO4
20.	Line and phase voltage/current relations;	Lecture, discussion	R2 & R3	L1,L2,L3,L5	CO2, CO4
21.	Three phase power	Lecture, discussion	R3	L1,L2,L3,L6	CO2, CO4
22.	Power measurement using two wattmeter method.	Lecture, discussion	R3	L1,L2,L3,L6	CO2, CO4
23.	Line and phase voltage/current relations; Numerical	Lecture, discussion & Demonstration	R3	L1,L2,L3,L6	CO2, CO4
24.	Unit-IV Single phase Transformer:	Lecture, discussion & Demonstration	R2 & R3	L1,L2,L3,L6	CO3
25.	Principle of operation	Lecture, discussion & Demonstration	R2 & R3	L1,L2,L3,L6	CO3
26.	Types of construction	Lecture, discussion & Demonstration	R2 & R3	L1,L2,L3,L6	CO3
27.	Phasor diagram T/F	Lecture, discussion & Demonstration	R3,R4	L1,L2,L3,L6	CO3
28.	Equivalent circuit T/F	Lecture, discussion & Demonstration	R3,R1	L1,L2,L3,L6	CO3

Pedagogy/Teaching Method:

C&T:-
Chalk
& Talk;
S/P:-

29.	Efficiency T/F	Lecture, discussion & Demonstration	R3,R2,R6	L1,L2,L3,L6	CO3
30.	losses. T/F	Lecture, discussion & Demonstration	R3	L1,L2,L3,L6	CO3
31.	Numerical Efficiency T/F	Lecture, discussion & Demonstration	R3	L1,L2,L3,L6	CO3
32.	Numerical losses. T/F	Lecture, discussion & Demonstration	R3	L1,L2,L3,L6	CO3
33.	DC Machine	Lecture, discussion	R3	L1,L2,L3,L6	CO5
34.	Electromechanical Energy Conversion	Lecture, discussion	R3	L1,L2,L3,L6	CO5
35.	DC machines: Principle & Construction,	Lecture, discussion & Demonstration	R3	L1,L2,L3,L6	CO5
36.	Types, of DC Machine.	Lecture, discussion & Demonstration	R3	L1,L2,L3,L6	CO5
37.	EMF equation of DC generator.	Lecture, discussion & Demonstration	R3	L1,L2,L3	CO5
38.	Torque equation of motor,	Lecture, discussion	R3	L1,L2,L3,L6	CO5
39.	applications of DC Generator (simple numerical problems)	Lecture, discussion & Demonstration	R3	L1,L2,L3,L6	CO5
40.	applications of DC motors (simple numerical problems)	Lecture, discussion & Demonstration	R3	L1,L2,L3,L6	CO5

Slides/PPT;Videos; SEM: Seminar; Demo; CHART; ET/GL: Expert Talk/Guest Lecture; QUIZ; CPS: Class room problem solving; GD:-Group discussion; RTCS: Real time case studies; JAR:-Journal article review; PD:-Poster design; OL:-Online lecture/Google class room; Industrial Visit (IV), Assignment (ASG), Quiz/Puzzle (Q), Brain storming (BS), Think-Pair-Share (TPS), Certification(CERT), SIM: Simulation, P/G: Pledge/Greeting, Q/R: Quotes, references, LS: Literature Survey, RW: Report Writing, MM:Model making, PED: Professional/ethical dilemma, Coding, Activity/Event, FV: Filed Visit etc.

Book and References

Text Books:

2. Nagrath I.J., Basic Electrical Engineering, Tata McGraw Hill

Reference Books:

1. Fitzgerald A.E & Higginbotham., D.E., Basic Electrical Engineering, McGraw Hill.
2. A Grabel, Basic Electrical Engineering, McGraw Hill.

3. Cotton H., Advanced Electrical Technology, Wheeler Publishing.
4. Del Toro, Principles of Electrical Engineering, Prentice-Hall International.
5. W.H. Hayt & J.E. Kemmerly, Engineering Circuit Analysis, McGraw Hill.

Web references should be used from:

- NPTEL / SWAYAM
- e-PG Pathashala
- MOOCs
- Other Government initiatives <https://www.education.gov.in/en/ict-initiatives> / UP Govt. MOOC
- Institution LMS

E-content Web Links

- <https://archive.nptel.ac.in/courses/108/105/108105112/>
- <https://archive.nptel.ac.in/courses/108/105/108105053/>
- <https://nptel.ac.in/courses/108108076>

TIME TABLE

B.Tech. (CSE) I Semester (A)

Dr. Shubhendra Pratap Singh

	9:30 -10:25	10:30- 11:25	11:30-12:25	12:30-01:25	01:25-2:25	2:25-3:10	3:10-3:55
MON			EAS162 (A2) / EEE161 (A1)		L U N C H		
TUE				EEE117			
WED				EEE117			
THU	EME161 (A1)/ EEE161 (A2)		EEE117				
FRI				EEE117			
SAT							

S. No	Course Code	Subject Name	Room No	Short Name	Faculty Name
1	EEE117	Basics Electrical Engineering	3101	DSP	Dr. Shubhendra Pratap Singh
2	EEE161	Basics Electrical Engineering (Lab)	2229	DSP	Dr. Shubhendra Pratap Singh

B.Tech. (CSE) I Semester (B)

Dr. Shubhendra Pratap Singh

	9:30 –10:25	10:30–11:25	11:30-12:25	12:30-01:25	01:25-2:25	2:25-3:10	3:10-3:55
MON					L U N C H	EEE117	
TUE						EEE117	
WED							
THU				EEE117		EEE161 (B2) / Library B1	
FRI	EEE117					EEE161 (B1) / B2 Library	
SAT							

S. No	Course Code	Subject Name	Room No	Short Name	Faculty Name
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1	EEE117	Basics Electrical Engineering	3106	DSP	Dr. Shubhendra Pratap Singh
2	EEE161	Basics Electrical Engineering (Lab)	2229	DSP	Dr. Shubhendra Pratap Singh

Student List

Course Name: Basic Electrical Engineering

Course Code: EEE117

Sl.	Enrolment No.	Student Name	Section
1	TCA2409004	ABHAY RAJ SINGH	A
2	TCA2409008	ABHISHEK KUMAR	A
3	TCA2409026	ANAMTA NAQVI	A
4	TCA2409029	ANIMESH JAIN	A
5	TCA2409032	ANKIT KUMAR	A
6	TCA2409042	ANURAG YADAV	A
7	TCA2409045	ARCHANA KUMARI	A
8	TCA2409048	ARPIT JAIN	A
9	TCA2409055	ATUL KUMAR GUPTA	A
10	TCA2409058	AYUSH SINGH	A
11	TCA2409061	DAKSH RUHELA	A
12	TCA2409073	HARSH JAIN	A
13	TCA2409075	HARSHIT JAIN	A
14	TCA2409076	HARSHIT JAIN	A
15	TCA2409081	HRITHIK PAWAR	A
16	TCA2409084	JAY RAM KUMAR MANDAL	A
17	TCA2409086	KAMAL	A
18	TCA2409087	KARTIK KUMAR SINGH	A
19	TCA2409089	KRATI JAIN	A
20	TCA2409092	LAKSHYA GAHLOUT	A
21	TCA2409100	MANYUPMA KUMARI	A
22	TCA2409106	MOHAMMAD AMAAN	A
23	TCA2409111	MOHD AYAN	A
24	TCA2409116	NIKSHAY JAIN	A
25	TCA2409119	OMPRAKASH	A

26	TCA2409122	PANKAJ KUMAR	A
27	TCA2409124	PARTH JAIN	A
28	TCA2409127	PRAJJAWAL SINGH	A
29	TCA2409128	PRAPHOOL KUMAR	A
30	TCA2409131	PRINCE KUMAR PATEL	A
31	TCA2409135	PUNEET CHAUHAN	A
32	TCA2409139	RANJEET KUMAR	A
33	TCA2409155	SEHWAG GOUR	A
34	TCA2409166	SNEHA JAIN	A
35	TCA2409167	SONU KUMAR	A
36	TCA2409171	TANISH CHAUHAN	A
37	TCA2409172	TANZILA BASIR	A
38	TCA2409176	UTKARSH CHAUHAN	A
39	TCA2409185	VINAYAK AGRAHARI	A
40	TCA2409187	VISHVAMOHAN SHARMA	A
41	TCA2409005	ABHIMANYU RAI	A
42	TCA2409006	ABHINAV SUNIL PATIL	A
43	TCA2409010	ABHISHEK SHUKLA	A
44	TCA2409013	ADI JAIN	A
45	TCA2409020	AKSHITA JAIN	A
46	TCA2409021	AMAAN SHAHID	A
47	TCA2409022	AMAN THAPAN	A
48	TCA2409025	AMRUTA VILAS HUDDAR	A
49	TCA2409030	ANIMESH JAIN	A
50	TCA2409033	ANKIT KUMAR	A
51	TCA2409034	ANKIT KUMAR	A
52	TCA2409038	ANSH JAIN	A
53	TCA2409039	ANSHIK KUMAR GUPTA	A
54	TCA2409049	ARUN	A
55	TCA2409050	ARUN KUMAR	A
56	TCA2409053	ASHUTOSH KUMAR RAI	A
57	TCA2409056	AVADHESH KUMAR SHARMA	A
58	TCA2409064	DIVYANSH BHARDWAJ	A
59	TCA2409067	GAGANDEEP SHARMA	A
60	TCA2409072	GYAYAK PATODI	A
61	TCA2409078	HIMANSHU JAIN	B

62	TCA2409095	MAHAK JAIN	B
63	TCA2409096	MANAS MADHAV	B
64	TCA2409097	MANISEN GUPTA	B
65	TCA2409105	MISHIKA JAIN	B
66	TCA2409114	NAVED ALAM	B
67	TCA2409115	NIKET JAIN	B
68	TCA2409129	PRATEEK JAIN	B
69	TCA2409130	PRINCE JAIN	B
70	TCA2409138	RADHIKA VERMA	B
71	TCA2409143	RIDDHI JAIN	B
72	TCA2409148	SAMEER	B
73	TCA2409149	SAMYAK JAIN	B
74	TCA2409150	SANSKAR PATIL	B
75	TCA2409158	SHALABH CHAUDHARY	B
76	TCA2409159	SHASHANK KUMAR MISHRA	B
77	TCA2409160	SHEETAL	B
78	TCA2409162	SHIVANG YADAV	B
79	TCA2409175	URJA JAIN	B
80	TCA2409182	VANSH KUMAR	B
81	TCA2409193	ZAINAB AYYOOB	B
82	TCA2409001	ABDUL MUNEEB KHAN	B
83	TCA2409002	ABDUS SUBOOR KHAN	B
84	TCA2409007	ABHISHEK JAIN	B
85	TCA2409016	AJAY KUMAR	B
86	TCA2409027	ANAND MISHRA	B
87	TCA2409028	ANAND RAJ	B
88	TCA2409037	ANSH CHAUDHARY	B
89	TCA2409041	ANUJ PAL	B
90	TCA2409044	ANVI JAIN	B
91	TCA2409047	ARPAN KUMAR	B
92	TCA2409052	ASHUTOSH KUMAR	B
93	TCA2409059	AZHAAN MOHAMMAD KHAN	B
94	TCA2409060	DAKSH JAIN	B
95	TCA2409066	DIVYANSHU KUMAR	B
96	TCA2409077	HEMANT CHAHAL	B
97	TCA2409083	JAMSHED ALAM	B

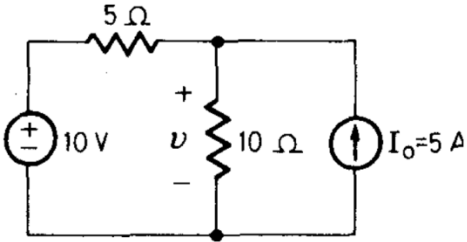
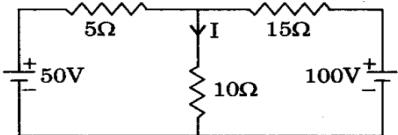
98	TCA2409091	KRISH PAL	B
99	TCA2409099	MANYA JAIN	B
100	TCA2409107	MOHAMMAD FAIZ	B
101	TCA2409109	MOHAMMAD HANZALA GAZI	B
102	TCA2409112	MUSKAN	B
103	TCA2409113	NAMAN JAIN	B
104	TCA2409120	PALAK JAIN	B
105	TCA2409121	PALAK SHARMA	B
106	TCA2409125	PARTH SHARMA	B
107	TCA2409132	PRITAN KUMAR	B
108	TCA2409137	RADHIKA	B
109	TCA2409146	ROCKEY RAJ	B
110	TCA2409152	SATYAM JAIN	B
111	TCA2409156	SHAFIA KHATOON	B
112	TCA2409161	SHIMPU	B
113	TCA2409164	SHREYA PANDEY	B
114	TCA2409169	SRISTI RANI	B
115	TCA2409177	UTKARSH GUPTA	B
116	TCA2409179	VANDANA KUMARI	B
117	TCA2409181	VANSH JAIN	B
118	TCA2409183	VARSHA	B
119	TCA2409189	VISHWAS RASTOGI	B
120	TCA2409190	VIVEK YADAV	B

Assignment-I

Year: I	Semester: I	Academic Session: 2024-25
Course Code: EEE117	Course Name: Basic Electrical Engineering	
		Max. Marks: 20

*Bloom Level {1-Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating}

Attempt all questions.

		MM	Unit	BTL	CO
1	What do you understand by Passive, active, bilateral, unilateral, linear, nonlinear elements?	1	1	1	1
2	State and explain Ohm's law with example.	1	1	2	1
3	State and explain KVL and KCL with examples.	2	1	2	1
4	Explain current division rule and voltage division rule with examples.	2	1	1	1
5	State and explain superposition theorem. Find v in the circuit of given figure using superposition theorem.	2	1	3	5
					
6	State and explain Thevenin's theorem.	2	1	2	1
7	State and explain Norton's theorem.	2	1	1	1
8	State and prove maximum power transfer theorem.	2	1	2	1
9	Explain Delta/star and star/delta transformations.	2	1	2	1
10	A generator develops 200V and has an internal resistance of 100Ω . Find the power delivered to the load of (i) 100Ω (ii) 300Ω . Comment the results.	2	1	3	5
11	For the circuit shown in figure, determine the current I through the 10Ω resistance by Thevenin's and Norton's theorem.	2	1	4	5
					

Assignment-II

Year: I	Semester: I	Academic Session: 2024-25
Course Code: EEE117	Course Name: Basic Electrical Engineering	
		Max. Marks: 20

*Bloom Level {1-Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating}

Attempt all questions.

		MM	Unit	BTL	CO
1	Define Impedance.	1	2	1	2
2	Define Resonance.	1	2	1	2
3	What is a Resonant frequency?	1	2	1	2
4	What is a parallel resonance?	1	2	1	2
5	Determine the power factor of a RLC series circuit with $R=5\Omega$, $X_L=8\Omega$ and $X_C=12\Omega$.	1	2	2	1
6	A resistor, a capacitor and a variable inductor are connected in series across 230V, 50Hz supply. Maximum current obtainable by varying the inductance is 0.314A and voltage across the capacitor is then 300V. Determine circuit parameters R, L, C. Draw phasor diagram under this condition.	3	2	3	1
7	A $20\mu\text{F}$ capacitor and a parallel 200 resistor draw 4A at 60Hz. Find power components.	3	2	3	1
8	What do you understand by lower and upper half power frequencies? Derive the relation for band width in terms of lower and upper half frequencies.	3	2	2	2
9	An alternating voltage is given by $V=230\sin 314t$. Calculate i) frequency, ii) maximum value, iii) average value, iv) RMS value.	3	2	3	2
10	What is the condition of resonance in series RLC circuit. Derive the relation for resonant frequency, band width and quality factor.	3	2	1	2

Assignment-III

Year: I	Semester: I	Academic Session: 2024-25
Course Code: EEE117	Course Name: Basic Electrical Engineering	
		Max. Marks: 20

*Bloom Level {1-Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating}

Attempt all questions.

		MM	Unit	BTL	CO
1	What do you mean by line voltage and phase voltage	1	3	2	3
2	What is power factor?	1	3	1	2
3	Write the full name of PMMC.	1	3	1	3
4	Three-phase star-connected load when supplied from 400 V, 50 Hz source takes a line current of 10 A. w.r.t. its line voltage. Calculate its phase voltage.	1	3	3	3
5	State the relationship between line voltage & phase voltage and line current & phase current of a 3- Φ phase delta connected system.	1	3	2	3
6	Explain the construction and working of dynamometer type wattmeter. Mention its merits and demerits.	3	3	3	3
7	Explain the extension of range for ammeter & voltmeter.	3	3	3	3
8	Explain the construction and working of an energy meter.	3	3	3	3
9	Derive the relation between phase and line voltage for 3 phase star-connected system.	3	3	3	2
10	Prove $P_{3\Phi} = \sqrt{3} E_{LL} I_{L} \cos \Phi$ for 3- Φ Delta connected system.	3	3	3	2



Assignment-IV

Year: I	Semester: I	Academic Session: 2024-25
Course Code: EEE117	Course Name: Basic Electrical Engineering	
		Max. Marks: 20

*Bloom Level {1-Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating}

Attempt all questions.

		MM	Unit	BTL	CO
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1	What is a Transformer?	1	4	2	4
2	Can DC be applied to transformers? Give reason to support your answer.	1	4	2	4
3	What is voltage transformation ratio or turn ratio?	1	4	2	4
4	Where is core type and shell type construction suitable for a transformer?	1	4	2	4
5	What are the losses occurring in a transformer?	1	4	2	4
6	What do you understand by the efficiency of a transformer? Obtain the condition for maximum efficiency.	3	4	2	4
7	A 40 kVA single phase transformer has iron losses of 800w and copper loss of 1140w when supplying its full load at unity p.f. Calculate the efficiency of the transformer at unity power factor at full load and half load.	3	4	3	4
8	A 3300V/200V, 50Hz, 100KVA transformer has its low voltage winding with 80 turns. Calculate (i) The currents in both windings. (ii) Number of turns of high voltage windings and (iii) Maximum value of the flux. Given that the transformer is loaded to its full capacity.	3	4	3	4
9	Explain different type of losses occur in transformer.	3	4	3	4
10	Explain open circuit test (no load test) and Short Circuit test (Impedance test).	3	4	1	4



Assignment-V

Year: I	Semester: I	Academic Session: 2024-25
Course Code: EEE117	Course Name: Basic Electrical Engineering	
		Max. Marks: 20

*Bloom Level {1-Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating}

Attempt all questions.

		MM	Unit	BTL	CO
1	What is the significance of yoke in DC machine.	1	5	2	5
2	Why is it commutator needed?	1	5	2	5
3	What is the function of brushes in DC machines.	1	5	2	5

4	Calculate the line & phase current of a star-connected 10,000 volts, 3-phase generator supplying 5,000 kW at a lagging p.f. of 0.8.	1	5	2	5
5	Draw the equivalent diagram of a d.c. motor armature circuit.	1	5	2	5
6	With the help of a neat diagram discuss the various parts of a dc machine.	3	5	2	5
7	With the help of a neat diagram discuss shunt wound DC motor.	3	5	3	5
8	Derive the e.m.f. equation of a D.C. machine.	3	5	3	5
9	Derive the expression for the torque of a d.c. motor.	3	5	3	5
10	What is a D.C. machine? Explain the principle of working of a D.C. machine.	3	5	1	5



Faculty of Engineering

FIRST INTERNAL EXAMINATION (CT-1)

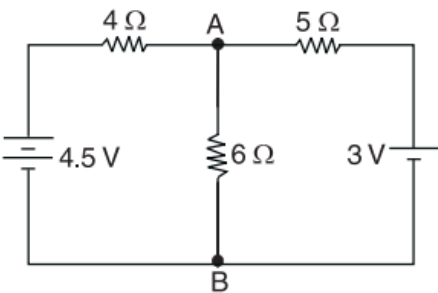
Program Name: B. Tech. (CSE)

Year: 1 st	Semester: I	Academic Session: 2024-25
Course Code: EEE117	Course Name: Basic Electrical Engineering	
Duration: 90 minutes	Max. Marks: 30	

*Bloom Level {1-Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating}

Attempt all questions.

1.	SHORT QUESTION	MM	Unit	BTL	CO
	<u>Answer any five questions</u>				
A.	What is the difference between active and passive elements?	(2)	1	1	1
B.	What is the condition for maximum power output when load is variable?	(2)	1	2	1
C.	Write and explain Ohm's Law.	(2)	1	1	1
D.	Write four advantages of 3phase AC system over Single phase AC system.	(2)	3	1	2
E.	For a 3phase star connected system Line to line Voltage and currents are 400V and 20A respectively, Find phase parameters?	(2)	3	2	2
F.	In power measurement by two-Wattmeter, $W_1=10KW$ and $W_2=5KW$. Find power factor of the load.	(2)	3	3	2
G.	Find the Average value of Sine wave having peak value of 100 Volt.	(2)	2	3	1

	H.	Draw the phasor representation of voltage and current in RC circuit excited by sinusoidal voltage supply. If phase angle is 60 degree, find its power factor.	(2)	2	1	1
LONG QUESTIONS						
2.	A	Using Thevenin's theorem, find the current in 6 Ω resistor				
			(10)	1	3	1
OR						
	B	Discuss the principle of operation of a single phase transformer. Derive EMF equation for a single phase transformer.	(10)	4	4	2
3.	A	The voltage applied to a circuit is $v=100\sin(\omega t+30)$ and current flowing in the circuit is $i=20\sin(\omega t+60)$. Find (i) Impedance (ii) Resistance (iii) Reactance and (iv) power factor, of the circuit.	(10)	2	3	1
OR						
	B	A balance star connected load of $(8+j6)$ ohm per phase is connected to 3-phase, 400V supply. Find line current, phase current, total power, power factor?	(10)	2	4	2

Course Outcome Wise Marks Distribution	CO1	CO2	CO3	CO4	CO5
	30	26			
Bloom's Taxonomy Wise Marks Distribution	L1	L2	L3	L4	L5
	8	4	24	20	



Faculty of Engineering

SECOND INTERNAL EXAMINATION (CT-2)

Program Name: B. Tech. (CSE)

Year: 1 st	Semester: I	Academic Session: 2024-25
Course Code: EEE117	Course Name: Basic Electrical Engineering	
Duration: 90 minutes	Max. Marks: 30	

*Bloom Level {1-Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating}

Attempt all questions.

1.	SHORT QUESTION		Max Marks	Unit	Bloom Level*	CO
	<u>Answer any five questions</u>					
	A	What happen if the primary winding of transformer is connected with DC supply.	(2)	4	1	3
	B	What are different types of measuring instruments? explain in brief	(2)	3	2	4
	C	Explain the analogy between electric and magnetic circuit.	(2)	4	2	3
	D	Give the types of errors in single phase energy meter.	(2)	3	1	4
	E	What are the properties of ideal transformer and draw its phasor diagram?	(2)	4	2	3
	F	Give the types of torques essential for indicating instruments.	(2)	3	1	4
	G	Explain the working principal of Transformer?	(2)	4	2	3
	H	What is the angle between line to line and line to phase voltage in 3-phase system, draw phasor diagram also.	(2)	3	1	4
	LONG QUESTIONS					
2.	A	The full-scale deflection of a meter is 1 mA and its internal resistance is 100 Ω. If this meter is to have full-scale deflection when 100 V is measured. What should be the value of series resistor?	(10)	3	4	4
	OR					
	B	Draw the equivalent circuit with proper labelling and phasor diagrams of transformer on lagging and leading loads.	(10)	4	4	3
3.	A	Explain the construction and working principle of a PMMC type instrument in detail.	(10)	3	2	4
	OR					
	B	Explain the different losses in transformer in brief. Derive the expression of efficiency and the condition of maximum efficiency in single phase transformer	(10)	4	2	3

Course Outcome Wise Marks Distribution	CO1	CO2	CO3	CO4	CO5
			28	28	
Bloom's Taxonomy Wise Marks Distribution	L1	L2	L3	L4	L5
	8	28		20	



Faculty of Engineering

THIRD INTERNAL EXAMINATION (CT-3)

Program Name: B. Tech. (CSE)

Year: 1 st	Semester: I	Academic Session: 2024-25
Course Code: EEE117	Course Name: Basic Electrical Engineering	
Duration: 90 minutes	Max. Marks: 30	

*Bloom's Taxonomy Level(BTL): {1-Remembering, 2-Understanding, 3-Applying, 4-Analyzing, 5-Evaluating, 6-Creating}

1. SHORT QUESTION		MM	Unit	BTL	CO	
<u>Answer any five questions</u>						
A.	What is Kirchoff's voltage law?	(2)	1	1	5	
B.	Convert $8+6j$ in to polar form and $16\angle 90^\circ$ into rectangular form.	(2)	2	2	5	
C.	Write the significant conditions of series resonance.	(2)	2	2	1	
D.	What is the angle between line to line and line to phase voltage in 3-phase system, draw phasor diagram also.	(2)	3	1	2	
E.	Explain Kirchoff's current law	(2)	1	1	1	
F.	What are the disadvantages of one wattmeter method for power measurement in 3 phase system?	(2)	3	2	4	
G.	What are the different kind of Transformer losses? Enumerate and explain.	(2)	4	1	3	
H.	Give the formula for maximum efficiency and corresponding load for a single-phase transformer	(2)	4	2	3	
LONG QUESTIONS						
2.	A	An 8 pole dc shunt generator with 778 wave connected armature conductors and running at 500 rpm, supply a load of 12.5 ohm resistance at terminal voltage of 250 volts, the armature resistance is 0.24ohm and field resistance is 250ohms.Find the armature current ,the induced emf and flux per pole.	(10)	5	4	5
OR						
	B	Give the Statement of Nortons Theorem with circuit diagram. What will be the value of R_3 for maximum power transfer, also find the value of maximum power.	(10)	1	3	5

3.	A	A 4-pole shunt generator with lap connected armature has field and armature resistance of 50 ohm and 0.1 ohm respectively. It supplies power to sixty 100V, 40W lamps calculate the armature current and generated emf. Allow a contact drop of 1V per brush.	(10)	5	4	5
	OR					
	B	In the following circuit find the current in all the branches using Nodal analysis.	(10)	1	3	5

Course Outcome Wise Marks Distribution	CO1	CO2	CO3	CO4	CO5
	4	2	4	2	44
Bloom's Taxonomy Wise Marks Distribution	L1	L2	L3	L4	L5
	8	8	10	10	

Internal Award List

PROGRAM : B.TECH-(COMPUTER SCIENCE)

MAX. MARKS : 40.00

SEMESTER : FIRST SEMESTER

SESSION : 2024-25

COURSE : BASIC ELECTRICAL ENGINEERING

COURSE CODE : EEE117

COLLEGE : COLLEGE OF COMPUTING SCIENCES
& INFORMATION TECHNOLOGY

SL. NO.	ENROLLMENT NO.	STUDENT'S NAME	ASSESSMENT BASES					TOTAL OBTAINED MARKS	
			CT1	CT2	CT3	ASN	ATT	IN FIGURE	IN WORDS
MARKS			10.00	10.00	10.00	10.00	10.00	40.00	FOURTY
1	TCA2409004	ABHAY RAJ SINGH	4.00	4.00	7.33	9.00	8.00	28.33	TWENTY EIGHT
2	TCA2409008	ABHISHEK KUMAR	0.67	7.33	6.33	8.00	10.00	31.66	Thirty Two
3	TCA2409026	ANAMTA NAQVI	8.33	9.67	10.00	10.00	10.00	39.67	Forty
4	TCA2409029	ANIMESH JAIN	6.00	6.00	0.67	9.00	9.00	30.00	Thirty
5	TCA2409032	ANKIT KUMAR	6.00	9.67	9.33	8.00	10.00	37.00	Thirty Seven
6	TCA2409042	ANURAG YADAV	4.00	5.33	8.00	10.00	9.00	32.33	Thirty Two
7	TCA2409045	ARCHANA KUMARI	7.33	9.67	AB	9.00	10.00	36.00	Thirty Six
8	TCA2409048	ARPIT JAIN	8.33	8.00	AB	9.00	10.00	35.33	Thirty Five
9	TCA2409055	ATUL KUMAR GUPTA	5.00	5.33	3.67	9.00	10.00	29.33	Twenty Nine
10	TCA2409058	AYUSH SINGH	8.67	9.67	AB	10.00	10.00	38.34	Thirty Eight
11	TCA2409061	DAKSH RUHELA	6.67	8.67	3.00	9.00	10.00	34.34	Thirty Four
12	TCA2409073	HARSH JAIN	6.00	7.33	5.00	8.00	9.00	30.33	Thirty
13	TCA2409075	HARSHIT JAIN	8.00	9.33	AB	9.00	10.00	36.33	Thirty Six
14	TCA2409076	HARSHIT JAIN	3.33	4.00	7.33	7.00	9.00	27.33	Twenty Seven
15	TCA2409081	HRITHIK PAWAR	4.00	8.00	0.67	7.00	9.00	28.00	Twenty Eight

16	TCA2409084	JAY RAM KUMAR MANDAL	3.33	7.33	AB	9.00	9.00	28.66	Twenty Nine
17	TCA2409086	KAMAL	5.00	5.00	7.00	8.00	10.00	30.00	Thirty
18	TCA2409087	KARTIK KUMAR SINGH	2.33	5.00	5.67	10.00	9.00	29.67	Thirty
19	TCA2409089	KRATI JAIN	5.00	6.00	AB	10.00	9.00	30.00	Thirty
20	TCA2409092	LAKSHYA GAHLOUT	4.67	6.67	7.67	9.00	9.00	32.34	Thirty Two
21	TCA2409100	MANYUPMA KUMARI	5.33	AB	7.00	8.00	10.00	30.33	Thirty
22	TCA2409106	MOHAMMAD AMAAN	7.33	9.33	AB	9.00	10.00	35.66	Thirty Six
23	TCA2409111	MOHD AYAN	5.00	8.33	2.67	9.00	10.00	32.33	Thirty Two
24	TCA2409116	NIKSHAY JAIN	10.00	8.00	6.00	9.00	10.00	37.00	Thirty Seven
25	TCA2409119	OMPRAKASH	10.00	5.00	AB	10.00	10.00	35.00	Thirty Five
26	TCA2409122	PANKAJ KUMAR	5.67	3.00	6.00	8.00	9.00	28.67	Twenty Nine
27	TCA2409124	PARTH JAIN	6.00	AB	5.33	8.00	9.00	28.33	Twenty Eight
28	TCA2409127	PRAJJAWAL SINGH	3.33	6.33	9.00	7.00	9.00	31.33	Thirty One
29	TCA2409128	PRAPHOOL KUMAR	4.00	7.67	8.33	10.00	9.00	35.00	Thirty Five
30	TCA2409131	PRINCE KUMAR PATEL	3.67	4.00	3.33	8.00	9.00	24.67	Twenty Five
31	TCA2409135	PUNEET CHAUHAN	5.00	6.00	AB	8.00	9.00	28.00	Twenty Eight
32	TCA2409139	RANJEET KUMAR	7.33	6.00	9.67	10.00	9.00	36.00	Thirty Six
33	TCA2409155	SEHWAG GOUR	5.00	4.00	6.00	8.00	9.00	28.00	Twenty Eight
34	TCA2409166	SNEHA JAIN	AB	3.33	AB	10.00	9.00	22.33	Twenty Two
35	TCA2409167	SONU KUMAR	0.67	4.67	8.67	8.00	9.00	30.34	Thirty
36	TCA2409171	TANISH CHAUHAN	3.00	5.67	5.00	9.00	9.00	28.67	Twenty Nine
37	TCA2409172	TANZILA BASIR	9.67	9.33	AB	8.00	9.00	36.00	Thirty Six
38	TCA2409176	UTKARSH CHAUHAN	AB	7.67	8.67	9.00	9.00	34.34	Thirty Four
39	TCA2409185	VINAYAK AGRAHARI	2.67	4.67	5.67	9.00	10.00	29.34	Twenty Nine
40	TCA2409187	VISHVAMOHAN SHARMA	1.00	5.33	9.67	10.00	10.00	35.00	Thirty Five
41	TCA2409005	ABHIMANYU RAI	3.00	6.33	7.00	9.00	9.00	31.33	Thirty One
42	TCA2409006	ABHINAV SUNIL PATIL	7.33	7.33	AB	8.00	9.00	31.66	Thirty Two

43	TCA2409010	ABHISHEK SHUKLA	7.33	8.00	10.00	10.00	10.00	38.00	Thirty Eight
44	TCA2409013	ADI JAIN	6.00	6.00	5.00	9.00	9.00	30.00	Thirty
45	TCA2409020	AKSHITA JAIN	9.67	9.00	AB	8.00	9.00	35.67	Thirty Six
46	TCA2409021	AMAAN SHAHID	3.00	6.33	8.00	10.00	10.00	34.33	Thirty Four
47	TCA2409022	AMAN THAPAN	3.00	7.00	7.00	9.00	9.00	32.00	Thirty Two
48	TCA2409025	AMRUTA VILAS HUDDAR	5.67	8.00	AB	9.00	9.00	31.67	Thirty Two
49	TCA2409030	ANIMESH JAIN	5.00	5.33	3.67	9.00	9.00	28.33	Twenty Eight
50	TCA2409033	ANKIT KUMAR	8.67	9.67	AB	10.00	9.00	35.34	Thirty Five
51	TCA2409034	ANKIT KUMAR	6.67	8.67	3.00	9.00	10.00	34.34	Thirty Four
52	TCA2409038	ANSH JAIN	6.00	7.33	5.00	8.00	10.00	31.33	Thirty One
53	TCA2409039	ANSHIK KUMAR GUPTA	8.00	9.33	AB	9.00	9.00	35.33	Thirty Five
54	TCA2409049	ARUN	3.33	4.00	7.33	7.00	9.00	27.33	Twenty Seven
55	TCA2409050	ARUN KUMAR	4.00	8.00	0.67	7.00	9.00	28.00	Twenty Eight
56	TCA2409053	ASHUTOSH KUMAR RAI	5.67	7.33	8.00	9.00	9.00	33.33	Thirty Three
57	TCA2409056	AVADHESH KUMAR SHARMA	5.00	5.00	7.00	8.00	9.00	29.00	Twenty Nine
58	TCA2409064	DIVYANSH BHARDWAJ	2.33	5.00	5.67	10.00	9.00	29.67	Thirty
59	TCA2409067	GAGANDEEP SHARMA	5.00	6.00	AB	10.00	9.00	30.00	Thirty
60	TCA2409072	GYAYAK PATODI	4.67	6.67	7.67	9.00	10.00	33.34	Thirty Three
61	TCA2409078	HIMANSHU JAIN	5.33	AB	7.00	8.00	9.00	29.33	Twenty Nine
62	TCA2409095	MAHAK JAIN	7.33	9.33	AB	9.00	10.00	35.66	Thirty Six
63	TCA2409096	MANAS MADHAV	5.00	8.33	2.67	9.00	10.00	32.33	Thirty Two
64	TCA2409097	MANISEN GUPTA	10.00	8.00	6.00	9.00	9.00	36.00	Thirty Six
65	TCA2409105	MISHIKA JAIN	10.00	5.00	AB	10.00	10.00	35.00	Thirty Five
66	TCA2409114	NAVED ALAM	5.67	3.00	6.00	8.00	9.00	28.67	Twenty Nine
67	TCA2409115	NIKET JAIN	6.00	AB	5.33	8.00	9.00	28.33	Twenty Eight
68	TCA2409129	PRATEEK JAIN	3.33	6.33	9.00	7.00	9.00	31.33	Thirty One
69	TCA2409130	PRINCE JAIN	4.00	7.67	8.33	10.00	9.00	35.00	Thirty Five

70	TCA2409138	RADHIKA VERMA	3.67	4.00	6.00	8.00	9.00	27.00	Twenty Seven
71	TCA2409143	RIDDHI JAIN	5.00	6.00	AB	8.00	10.00	29.00	Twenty Nine
72	TCA2409148	SAMEER	7.33	6.00	9.67	10.00	9.00	36.00	Thirty Six
73	TCA2409149	SAMYAK JAIN	5.00	4.00	6.00	8.00	9.00	28.00	Twenty Eight
74	TCA2409150	SANSKAR PATIL	6.00	4.67	AB	10.00	9.00	29.67	Thirty
75	TCA2409158	SHALABH CHAUDHARY	5.33	4.67	8.67	8.00	9.00	31.00	Thirty One
76	TCA2409159	SHASHANK KUMAR MISHRA	6.67	9.33	10.00	9.00	9.00	37.33	Thirty Seven
77	TCA2409160	SHEETAL	7.33	8.00	4.33	8.00	10.00	33.33	Thirty Three
78	TCA2409162	SHIVANG YADAV	7.67	AB	9.33	9.00	10.00	36.00	Thirty Six
79	TCA2409175	URJA JAIN	6.67	7.00	AB	9.00	10.00	32.67	Thirty Three
80	TCA2409182	VANSH KUMAR	6.67	8.67	6.67	10.00	10.00	35.34	Thirty Five
81	TCA2409193	ZAINAB AYYOOB	3.33	0.00	9.00	9.00	9.00	30.33	Thirty
82	TCA2409001	ABDUL MUNEEB KHAN	9.33	7.00	AB	9.00	9.00	34.33	Thirty Four
83	TCA2409002	ABDUS SUBOOR KHAN	5.33	7.00	AB	8.00	9.00	29.33	Twenty Nine
84	TCA2409007	ABHISHEK JAIN	7.33	9.67	AB	10.00	9.00	36.00	Thirty Six
85	TCA2409016	AJAY KUMAR	7.00	8.00	AB	9.00	9.00	33.00	Thirty Three
86	TCA2409027	ANAND MISHRA	5.33	5.00	AB	8.00	9.00	27.33	Twenty Seven
87	TCA2409028	ANAND RAJ	4.33	5.67	AB	10.00	9.00	29.00	Twenty Nine
88	TCA2409037	ANSH CHAUDHARY	9.67	7.00	AB	9.00	9.00	34.67	Thirty Five
89	TCA2409041	ANUJ PAL	0.00	AB	AB	9.00	8.00	17.00	Seventeen
90	TCA2409044	ANVI JAIN	8.00	AB	7.00	9.00	10.00	34.00	Thirty Four
91	TCA2409047	ARPAN KUMAR	7.67	7.33	AB	10.00	9.00	34.00	Thirty Four
92	TCA2409052	ASHUTOSH KUMAR	5.00	8.67	AB	9.00	9.00	31.67	Thirty Two
93	TCA2409059	AZHAAN MOHAMMAD KHAN	6.00	6.33	AB	8.00	10.00	30.33	Thirty
94	TCA2409060	DAKSH JAIN	3.33	8.00	7.67	9.00	9.00	33.67	Thirty Four
95	TCA2409066	DIVYANSHU KUMAR	5.00	4.00	5.00	7.00	9.00	26.00	Twenty Six
96	TCA2409077	HEMANT CHAHAL	4.00	8.00	AB	7.00	10.00	29.00	Twenty Nine

97	TCA2409083	JAMSHED ALAM	5.67	7.33	AB	9.00	9.00	31.00	Thirty One
98	TCA2409091	KRISH PAL	5.00	5.00	AB	8.00	10.00	28.00	Twenty Eight
99	TCA2409099	MANYA JAIN	2.33	5.00	AB	10.00	9.00	26.33	Twenty Six
100	TCA2409107	MOHAMMAD FAIZ	7.67	8.33	AB	10.00	10.00	36.00	Thirty Six
101	TCA2409109	MOHAMMAD HANZALA GAZI	4.67	6.67	AB	9.00	10.00	30.14	Thirty
102	TCA2409112	MUSKAN	7.33	8.00	AB	8.00	10.00	33.33	Thirty Three
103	TCA2409113	NAMAN JAIN	7.33	8.67	AB	9.00	10.00	33.33	Thirty Three
104	TCA2409120	PALAK JAIN	6.67	8.33	AB	9.00	10.00	34.00	Thirty Four
105	TCA2409121	PALAK SHARMA	9.67	AB	10.00	9.00	10.00	38.67	Thirty Nine
106	TCA2409125	PARTH SHARMA	8.67	7.33	AB	10.00	9.00	35.00	Thirty Five
107	TCA2409132	PRITAN KUMAR	5.67	6.00	AB	8.00	9.00	28.67	Twenty Nine
108	TCA2409137	RADHIKA	10.00	10.00	AB	8.00	10.00	38.00	Thirty Eight
109	TCA2409146	ROCKEY RAJ	9.67	9.67	AB	7.00	9.00	35.34	Thirty Five
110	TCA2409152	SATYAM JAIN	9.67	9.67	AB	10.00	10.00	39.34	Thirty Nine
111	TCA2409156	SHAFIA KHATOON	9.67	9.67	AB	8.00	10.00	37.34	Thirty Seven
112	TCA2409161	SHIMPU	9.67	9.67	AB	8.00	10.00	37.34	Thirty Seven
113	TCA2409164	SHREYA PANDEY	9.67	9.00	AB	10.00	10.00	38.67	Thirty Nine
114	TCA2409169	SRISTI RANI	5.67	4.67	AB	8.00	8.00	26.34	Twenty Six
115	TCA2409177	UTKARSH GUPTA	7.00	9.67	AB	10.00	10.00	36.67	Thirty Seven
116	TCA2409179	VANDANA KUMARI	7.00	6.00	AB	8.00	10.00	31.00	Thirty One
117	TCA2409181	VANSH JAIN	6.67	8.33	AB	9.00	9.00	33.00	Thirty Three
118	TCA2409183	VARSHA	9.67	9.67	AB	8.00	10.00	37.34	Thirty Seven
119	TCA2409189	VISHWAS RASTOGI	8.00	8.00	AB	9.00	9.00	34.00	Thirty Four
120	TCA2409190	VIVEK YADAV	AB	6.33	AB	9.00	10.00	25.33	Twenty Five

CT-1 Solution

1 (A) What is the difference between active and passive elements?

Active Elements	Passive Elements
Can generate or supply energy to the circuit.	Cannot generate energy ; they consume or store energy .
Examples: Battery, transistor, operational amplifier	Examples: Resistor, capacitor, inductor
Capable of power gain .	Cannot provide power gain .
Require external source for operation (in case of controlled devices).	Operate without any external power source .

1 (B) What is the condition for maximum power output when load is variable?

Sol-

Maximum power is transferred to the load when the load resistance R_L is equal to the internal resistance R_s of the source.

Condition:

$$R_L = R_s$$

- This is known as the **Maximum Power Transfer Theorem**.

1 (C)

- Under this condition, the load receives the **maximum possible power** from the source.

Write and explain

Ohm's Law.

Sol-

Statement:

Ohm's Law states that **the current (I) flowing through a conductor is directly proportional to the voltage (V) across its ends, provided the temperature and physical conditions remain constant.**

Mathematical Form:

$$V = I \times R$$

Where:

- V = Voltage (Volts)
- I = Current (Amperes)
- R = Resistance (Ohms, Ω)



1 (D) Write four advantages of 3phase AC system over Single phase AC system.

Sol-

1. More Power:

Delivers more power for the same current compared to a single-phase system.

2. Constant Power Flow:

Power delivered is **continuous and smooth**, unlike the pulsating power in single-phase.

3. Higher Efficiency:

More efficient in power transmission with less conductor material for the same power.

4. Smaller and Cheaper Machines:

3-phase motors are **smaller, more efficient**, and have **better starting torque** than single-phase motors.

1 (E) For a 3phase star connected system Line to line Voltage and currents are 400V and 20A respectively, Find phase parameters?

Sol-

In a star-connected system:

Line voltage $V_L = 400\text{ V}$, so phase voltage $V_{ph} = \frac{400}{\sqrt{3}} \approx 230.94\text{ V}$.

Line current $I_L = 20\text{ A}$, and in star connection, $I_{ph} = I_L = 20\text{ A}$.

Phase Voltage = 230.94 V, Phase Current = 20 A.

1 (F) In power measurement by two-Wattmeter , $W_1=10\text{KW}$ and $W_2=5\text{KW}$. Find power factor of the load.

Sol-

Given: $W_1 = 10\text{ kW}$, $W_2 = 5\text{ kW}$

Power factor angle:

$$\tan \phi = \frac{\sqrt{3}(W_1 - W_2)}{W_1 + W_2} = \frac{\sqrt{3}(10 - 5)}{10 + 5} = \frac{5\sqrt{3}}{15} = \frac{\sqrt{3}}{3}$$

$$\phi = 30^\circ \Rightarrow \cos \phi = \boxed{0.866 \text{ (lagging)}}$$

1 (G)

Find the

Average value of Sine wave having peak value of 100 Volt.

Sol-

Given: Peak value $V_m = 100 \text{ V}$

Average value of sine wave over one half cycle:

$$V_{avg} = \frac{2V_m}{\pi} = \frac{2 \times 100}{\pi} \approx \frac{200}{3.1416} \approx 63.66 \text{ V}$$

Average Value = 63.66 V

1 (H) Draw the phasor representation of voltage and current in RC circuit excited by sinusoidal voltage supply. If phase angle is 60 degree, find its power factor.

Sol-

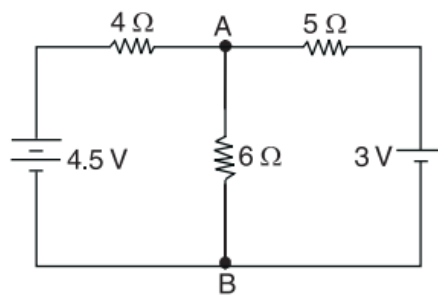
In an RC circuit, **current leads voltage**, so in the phasor diagram, current is drawn **ahead of voltage** by the phase angle.

Given phase angle $\phi = 60^\circ$,

$$\text{Power Factor} = \cos \phi = \cos 60^\circ = 0.5$$

Power Factor = 0.5 (leading)

Q2. (a) Using Thevenin's theorem, find the current in 6Ω resistor



Ans:

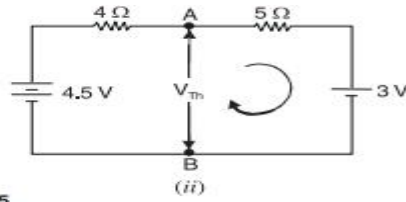
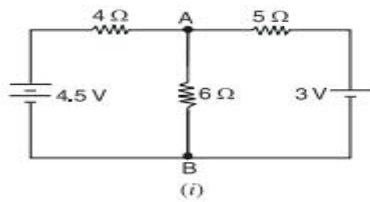


Fig. 3.85

Solution. Since internal resistances of batteries are not given, it will be assumed that they are zero. We shall find Thevenin's equivalent circuit at terminals AB in Fig. 3.85 (i).

V_{Th} = Voltage across terminals AB with load (i.e. $6\ \Omega$ resistor) removed as shown in Fig. 3.85 (ii).

$$= 4.5 - 0.167 \times 4 = 3.83\text{ V}$$

R_{Th} = Resistance at terminals AB with load (i.e. $6\ \Omega$ resistor) removed and battery replaced by a short as shown in Fig. 3.86 (i).

$$= \frac{4 \times 5}{4 + 5} = 2.22\ \Omega$$

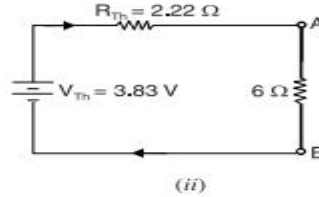
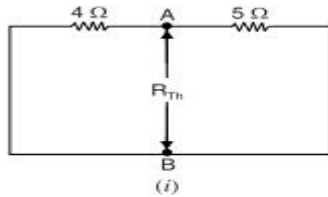


Fig. 3.86

Thevenin's equivalent circuit at terminals AB is V_{Th} ($= 3.83\text{ V}$) in series with R_{Th} ($= 2.22\ \Omega$). When load (i.e. $6\ \Omega$ resistor) is connected between terminals A and B , the circuit becomes as shown in Fig. 3.86 (ii).

$$\therefore \text{Current in } 6\ \Omega \text{ resistor} = \frac{V_{Th}}{R_{Th} + 6} = \frac{3.83}{2.22 + 6} = 0.466\text{ A}$$

Q2 (b) Discuss the principle of operation of a single phase transformer. Derive EMF equation for a single phase transformer.

Sol.

Single Phase Transformer – Working Principle

A single-phase transformer works on the principle of **electromagnetic induction** and **mutual induction**.

- It consists of **two windings** (Primary and Secondary) wound on a **magnetic core**.
- When **AC voltage** is applied to the **primary winding**, an **alternating magnetic flux (ϕ)** is produced in the core.
- This flux **links both windings** and induces an **EMF in the secondary winding** by **Faraday's law of electromagnetic induction**.
- The magnitude of EMF depends on the **number of turns** and the **rate of change of flux**.

EMF Equation of a Transformer

Let:

- N_1 = Number of primary turns
- N_2 = Number of secondary turns
- ϕ_m = Maximum flux in Weber
- f = Frequency of AC supply in Hz
- E_1, E_2 = RMS values of EMF in primary and secondary windings

Derivation:

The flux in the core is assumed to be sinusoidal:

$$\phi = \phi_m \sin(\omega t)$$

By Faraday's Law,



$$e = -N \frac{d\phi}{dt}$$

For maximum value:

$$e_{max} = N\omega\phi_m = 2\pi f N\phi_m$$

RMS value of sinusoidal EMF:

$$E = \frac{e_{max}}{\sqrt{2}} = \frac{2\pi f N\phi_m}{\sqrt{2}} = 4.44 f N\phi_m$$

Final EMF Equation:

$$E = 4.44 f N\phi_m$$

For primary and secondary:

$$E_1 = 4.44 f N_1 \phi_m \quad \downarrow \quad E_2 = 4.44 f N_2 \phi_m$$

Q3. (a) The voltage applied to a circuit is $v=100\sin(\omega t+30^\circ)$ and current flowing in the circuit is $i=20\sin(\omega t+60^\circ)$. Find (i) Impedance (ii) Resistance (iii) Reactance and (iv) power factor , of the circuit.

Ans:

RMS Values:

$$V_{rms} = 100 / \sqrt{2} = 70.71 \text{ V}$$

$$I_{rms} = 20 / \sqrt{2} = 14.14 \text{ A}$$

$$Z = V_{rms} / I_{rms} = 70.71 / 14.14 = 5 \Omega$$

Resistance (R)

$$\text{Phase Difference: } \phi = 30^\circ - 60^\circ = -30^\circ$$

$$R = Z * \cos(\phi) = 5 * \cos(-30^\circ) = 5 * \sqrt{3}/2 = 4.33 \Omega$$

Reactance (X)

$$X = \sqrt{(Z^2 - R^2)} = \sqrt{(25 - 18.75)} = \sqrt{6.25} = 2.5 \Omega$$

Since the current leads the voltage, the reactance is capacitive.

$$X = -2.5 \, \Omega \text{ (capacitive)}$$

Power Factor (pf)

$$\text{pf} = \cos(\phi) = \cos(-30^\circ) = 0.866 \text{ (leading)}$$

Q3(b) A balance star connected load of $(8+j6)$ ohm per phase is connected to 3-phase, 400V supply. Find line current, phase current, total power, power factor?

Given:

$$\text{Load Impedance per phase: } Z = 8 + j6 \, \Omega$$

$$\text{Supply Voltage (line-to-line): } V_{\text{line}} = 400 \, \text{V}$$

Calculations:

1. Phase Voltage (V_{phase})

$$V_{\text{phase}} = V_{\text{line}} / \sqrt{3} = 400 / \sqrt{3} = 230.94 \, \text{V}$$

2. Phase and Line Current ($I_{\text{phase}} = I_{\text{line}}$)

$$Z_{\text{phase}} = \sqrt{(8^2 + 6^2)} = 10.00 \, \Omega$$

$$I_{\text{phase}} = V_{\text{phase}} / Z_{\text{phase}} = 230.94 / 10.00 = 23.09 \, \text{A}$$

3. Power Factor

$$\text{pf} = \cos(\theta), \text{ where } \theta = \tan^{-1}(6/8) = 36.87^\circ$$

$$\text{pf} = \cos(0.64) = 0.800$$

4. Total Power

$$P_{\text{total}} = 3 \times V_{\text{phase}} \times I_{\text{phase}} \times \text{pf}$$

$$= 3 \times 230.94 \times 23.09 \times 0.800 = 12800.00 \, \text{W}$$

CT-2 Solution

CT-2 Solution

1. (a) If the **primary winding of a transformer is connected to a DC supply**, several harmful things can happen.

No Induced Voltage in Secondary Winding

- Transformers rely on **changing magnetic fields** (i.e., AC) to induce voltage in the secondary winding via **Faraday's Law of Electromagnetic Induction**.

- **DC provides constant current**, which creates a **steady magnetic field** — not a changing one — so **no voltage is induced** in the secondary.

Core Saturation

- In AC, the current constantly reverses direction, allowing the core's magnetic field to **periodically reset**.
- With DC, the current is constant, causing the core to quickly reach **magnetic saturation**. Once saturated, the core cannot carry any more magnetic flux effectively.

Very High Primary Current (Burnout Risk)

- Transformers are designed with high impedance to AC due to inductive reactance.
- For DC, the only opposition to current is the **resistance of the primary winding**, which is **very low**.
- As a result, a large current flows through the winding, leading to:
 - **Overheating**
 - **Winding insulation breakdown**
 - **Possible fire or damage**

(b) **The instrument used for measuring the physical and electrical quantities is known as the measuring instrument.** The term measurement means the comparison between the two quantities of the same unit. The magnitude of one of the quantity is unknown, and it is compared with the predefined value. The result of the comparison obtained regarding numerical value.

The measuring instrument categorised into three types;

- Electrical Instrument
- Electronic Instrument
- Mechanical Instrument

The mechanical instrument uses for measuring the physical quantities. This instrument is suitable for measuring the static and stable condition because the instrument is unable to give the response to the dynamic condition. **The electronic instrument has quick response time.** The instrument provides the quick response as compared to the electrical and mechanical instrument.

The electrical instrument is used for measuring electrical quantities like current, voltage, power, etc. The [ammeter](#), [voltmeter](#), wattmeter are the examples of the electrical measuring instrument. The ammeter measures the current in amps; voltmeter measures voltage and Wattmeter are used for measuring the power. The classification of the electric instruments depends on the methods of representing the output reading.

(c) The analogy between **electric and magnetic circuits** helps us understand magnetic behavior using familiar electrical concepts. Though the two are governed by different physical principles, they have striking similarities in structure and equations.

Analogy Between Electric and Magnetic Circuits

Electric Circuit	Magnetic Circuit	Explanation
Electromotive force (EMF) (V)	Magnetomotive force (MMF) (F)	EMF drives current; MMF drives flux
Electric current (I)	Magnetic flux (Φ)	Current flows through a wire; flux flows through a magnetic path
Resistance (R)	Reluctance ($\mathcal{R}$)	Opposition to current vs opposition to flux
Ohm's Law: $V = IR$	Magnetic Ohm's Law: $F = \Phi \mathcal{R}$	Both describe how force causes flow against opposition
Conductance (1/R)	Permeance (1/ $\mathcal{R}$)	Ease of flow: electrical vs magnetic
Resistivity (ρ)	Reluctivity (ν)	Material property resisting flow
Electric Power = VI	Magnetic power = $F\Phi$ (theoretical)	Energy concepts can be loosely compared
Electric field (E)	Magnetic field intensity (H)	Fields that drive the flow
Charge carriers	Magnetic dipoles	What creates current or flux

(d) Types of Errors in a Single-Phase Energy Meter:

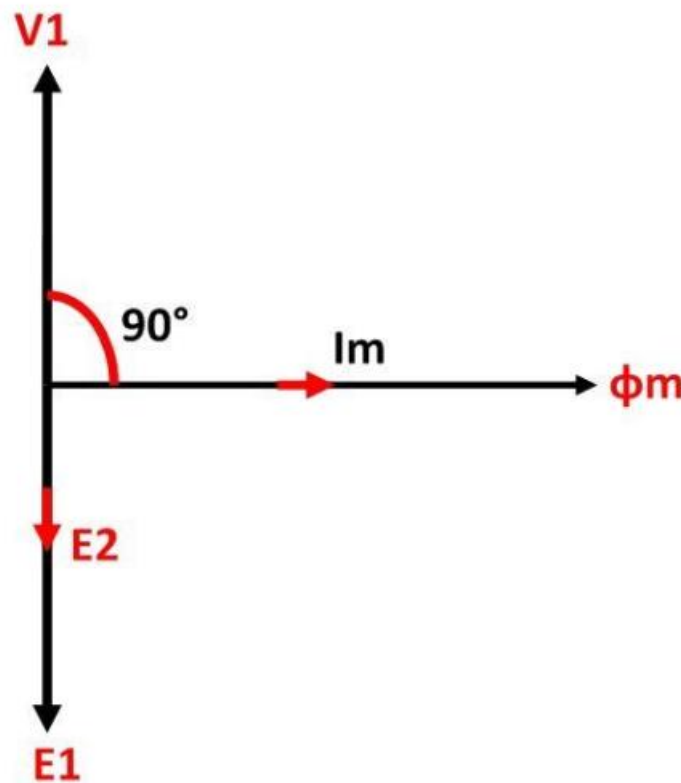
1. **Creeping Error** – Slow rotation of the disc without any load.
2. **Friction Error** – Due to mechanical friction in the disc and bearings.
3. **Phase Angle Error** – Incorrect phase difference between voltage and current coils.
4. **Temperature and Frequency Errors** – Due to variation in ambient conditions and supply frequency.
5. **Load Variation Error** – Inaccuracy at very light or very heavy loads.

(e) properties of ideal transformer

An ideal transformer is an imaginary transformer which has the following properties:

- The resistance of its primary and secondary winding is negligible.
- The permeability (μ) of the core of an ideal transformer is infinite, so that negligible mmf (magnetomotive force) is required to establish the flux in the core.
- The leakage flux and leakage inductances of an Ideal transformer are zero. It means the entire flux is confined to the core and links both windings.
- The losses due to resistance, hysteresis and eddy current are negligible. Hence the efficiency is 100 %.

It should be understood that practical transformer possesses none of the above mentioned properties, though the operation of practical transformer is close to ideal one.



Phasor diagram of an ideal transformer

(f) Types of Torques in Indicating Instruments (2 Marks):

1. Deflecting Torque (T_d):

- Moves the pointer from its zero position in response to the measured quantity.

2. Controlling Torque (T_c):

- Opposes the deflecting torque and brings the pointer to a steady final position (usually provided by springs or gravity).

3. Damping Torque (T_{damp}):

- Prevents oscillation and allows the pointer to settle quickly at the final position (provided by air or fluid damping).

(g) A transformer works on the principle of **electromagnetic induction**. When an **alternating current (AC)** flows through the **primary winding**, it produces a **changing magnetic flux** in the core. This flux links with the **secondary winding** and induces an **electromotive force (EMF)** according to **Faraday's law of electromagnetic induction**.

(h) In a balanced 3-phase system (star connection), the **angle between line-to-line voltage and line-to-phase voltage is 30°**

2.

The total voltage V across the series combination of the meter and resistor is:

$$V = I \times (R_m + R_s)$$

Rearranging to find R_s :

$$R_s = \frac{V}{I} - R_m$$

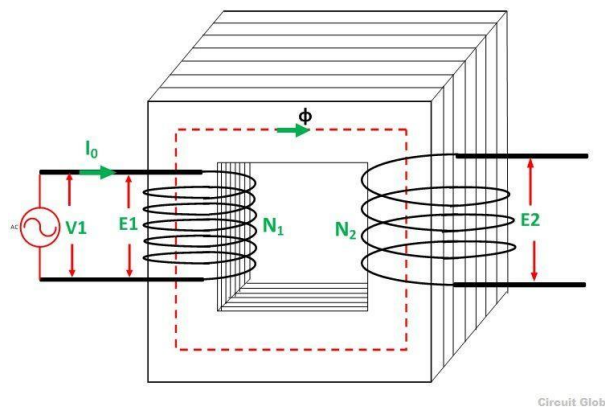
Substitute the values:

$$R_s = \frac{100}{0.001} - 100 = 100,000 - 100 = 99,900 \Omega$$

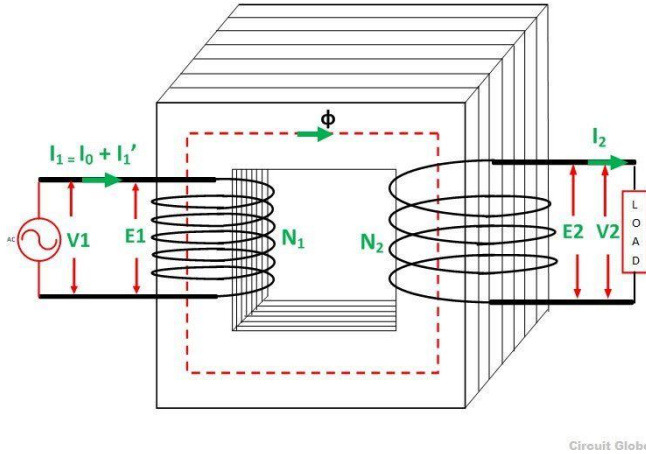
Or,

The Operation of the Transformer on Load Condition is explained below:

- When the secondary of the transformer is kept open, it draws the no-load current from the main supply. The no-load current induces the magnetomotive force $N_0 I_0$ and this force set up the flux Φ in the core of the transformer. The circuit of the transformer at no load condition is shown in the figure below:



- When the load is connected to the secondary of the transformer, I_2 current flows through their secondary winding. The secondary current induces the magnetomotive force $N_2 I_2$ on the secondary winding of the transformer. This force set up the flux ϕ_2 in the transformer core. The flux ϕ_2 opposes the flux ϕ , according to **Lenz's law**.



- As the flux ϕ_2 opposes the flux ϕ , the resultant flux of the transformer decreases and this flux reduces the induced EMF E_1 . Thus, the strength of the V_1 is more than E_1 and an additional primary current I'_1 drawn from the main supply. The additional current is used for restoring the original value of the flux in the core of the transformer so that $V_1 = E_1$. The primary current I'_1 is in phase opposition with the secondary current I_2 . Thus, it is called the **primary counter-balancing current**.
- The additional current I'_1 induces the magnetomotive force $N_1 I'_1$. And this force set up the flux ϕ'_1 . The direction of the flux is the same as that of the ϕ and it cancels the flux ϕ_2 which induces because of the MMF $N_2 I_2$

Now,

$$N_1 I'_1 = N_2 I_2$$

$$I'_1 = \left(\frac{N_2}{N_1} \right) I_2 = K I_2$$

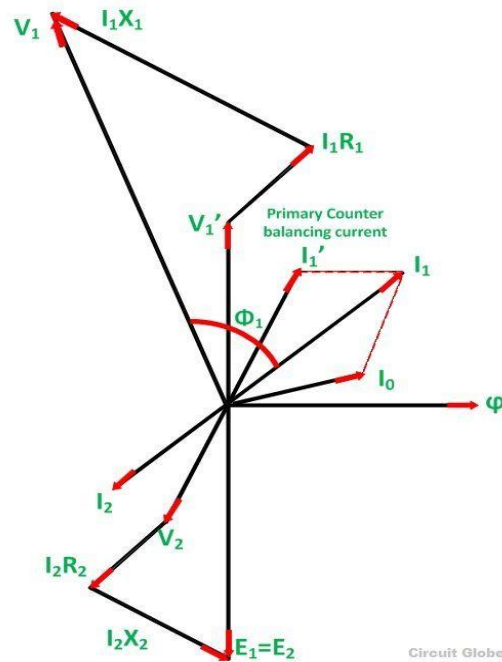
Therefore,

- The phase difference between V_1 and I_1 gives the power factor angle ϕ_1 of the primary side of the transformer.
- The power factor of the secondary side depends upon the type of load connected to the transformer.
- If the load is inductive as shown in the above phasor diagram, the power factor will be lagging, and if the load is capacitive, the power factor will be leading. The total primary current I_1 is the vector sum of the currents I_0 and I'_1 . i.e

$$\bar{I}_1 = \bar{I}_0 + \bar{I}'_1$$

Phasor Diagram of Transformer on Inductive Load

The phasor diagram of the actual transformer when it is loaded inductively is shown below:



Phasor Diagram of the Transformer on Inductive Load

Steps to draw the phasor diagram

- Take flux ϕ , a reference
- Induces emf E_1 and E_2 lags the flux by 90 degrees.
- The component of the applied voltage to the primary equal and opposite to induced emf in the primary winding. E_1 is represented by V_1' .
- Current I_0 lags the voltage V_1' by 90 degrees.
- The power factor of the load is lagging. Therefore current I_2 is drawn lagging E_2 by an angle ϕ_2 .
- The resistance and the leakage reactance of the windings result in a voltage drop, and hence secondary terminal voltage V_2 is the phase difference of E_2 and voltage drop.

$$V_2 = E_2 - \text{voltage drops}$$

$I_2 R_2$ is in phase with I_2 and $I_2 X_2$ is in quadrature with I_2 .

- The total current flowing in the primary winding is the phasor sum of I_1' and I_0 .
- Primary applied voltage V_1 is the phasor sum of V_1' and the voltage drop in the primary winding.
- Current I_1' is drawn equal and opposite to the current I_2

$$V_1 = V_1' + \text{voltage drop}$$

$I_1 R_1$ is in phase with I_1 and $I_1 X_1$ is in quadrature with I_1 .

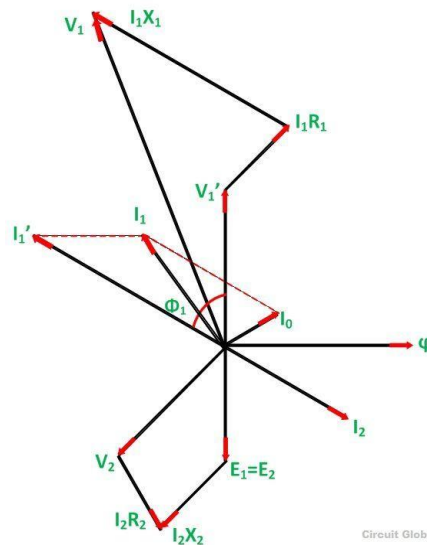
- The phasor difference between V_1 and I_1 gives the power factor angle ϕ_1 of the primary side of the transformer.
- The power factor of the secondary side depends upon the type of load connected to the transformer.

- If the load is inductive as shown in the above phasor diagram, the power factor will be lagging, and if the load is capacitive, the power factor will be leading. Where $I_1 R_1$ is the resistive drop in the primary windings
 $I_2 X_2$ is the reactive drop in the secondary winding

Similarly

Phasor Diagram of Transformer on Capacitive Load

The Transformer on the Capacitive load (leading power factor load) is shown below in the phasor diagram.



Phasor Diagram of the Transformer on Capacitive Load

Steps to draw the phasor diagram at capacitive load

- Take flux ϕ a reference
- Induces emf E_1 and E_2 lags the flux by 90 degrees.
- The component of the applied voltage to the primary equal and opposite to induced emf in the primary winding. E_1 is represented by V_1' .
- Current I_0 lags the voltage V_1' by 90 degrees.
- The power factor of the load is leading. Therefore current I_2 is drawn leading E_2
- The resistance and the leakage reactance of the windings result in a voltage drop, and hence secondary terminal voltage V_2 is the phasor difference of E_2 and voltage drop.

$$V_2 = E_2 - \text{voltage drops}$$

$I_2 R_2$ is in phase with I_2 and $I_2 X_2$ is in quadrature with I_2 .

- Current I_1' is drawn equal and opposite to the current I_2
- The total current I_1 flowing in the primary winding is the phasor sum of I_1' and I_0 .
- Primary applied voltage V_1 is the phasor sum of V_1' and the voltage drop in the primary winding.

$$V_1 = V_1' + \text{voltage drop}$$

$I_1 R_1$ is in phase with I_1 and $I_1 X_1$ is in quadrature with I_1 .

- The phasor difference between V_1 and I_1 gives the power factor angle ϕ_1 of the primary side of the transformer.
- The power factor of the secondary side depends upon the type of load connected to the transformer.

This is all about the phasor diagram on various loads.

3.

Permanent Magnet Moving Coil (PMMC) Instrument

A PMMC instrument is a widely used analog measuring instrument that operates based on the interaction between a magnetic field and a current-carrying coil.

Construction of PMMC Instrument:

1. **Permanent Magnet:**
 - A strong **U-shaped magnet** provides a uniform **radial magnetic field**.
 - Ensures that the deflecting torque is proportional to the current.
2. **Moving Coil:**
 - A **lightweight rectangular coil** of fine copper wire wound on an aluminum frame.
 - Placed between the poles of the magnet and mounted on a spindle.
3. **Soft Iron Core:**
 - A cylindrical **soft iron core** is fixed inside the coil to make the magnetic field **uniform and radial**.
 - Reduces the size and increases the sensitivity.
4. **Control Springs:**
 - Two **spiral springs** made of phosphor bronze provide **controlling torque** and also serve as current leads to the coil.
5. **Pointer and Scale:**
 - A pointer attached to the moving coil moves over a **graduated scale** to indicate the reading.
6. **Damping Mechanism:**
 - Damping is provided by **eddy currents** induced in the aluminum frame as it moves in the magnetic field, providing **air friction-free damping**.

Working Principle:

The PMMC instrument works on the **Lorentz force principle**, which states that a current-carrying conductor placed in a magnetic field experiences a force.

Step-by-Step Working:

1. **Current flows** through the moving coil when the instrument is connected in a circuit.
2. The coil lies in a **radial magnetic field** provided by the permanent magnet.
3. The interaction between the magnetic field and the current-carrying coil generates a **deflecting torque**:

$$T_d = N \cdot B \cdot I \cdot A$$

where:

N = number of turns

B = magnetic flux density

I = current

A = area of coil

4. The coil rotates, and the pointer deflects over the scale.
5. As the coil moves, the **control springs** exert a **restoring (controlling) torque**.
6. The pointer reaches a steady position when:

$$T_d = T_c$$

(Deflecting torque equals controlling torque)

Characteristics:

- **Scale is linear** because deflection is directly proportional to current.
- **High accuracy** and sensitivity.
- **Used only for DC measurements** (AC causes zero average torque due to reversal).

Applications:

- DC voltmeters and ammeters.
- Audio equipment (VU meters).
- Panel meters in control systems.

Or,

Losses in transformers can be broadly classified into two main categories: core losses and copper losses. Here's a breakdown:

Core Losses (Iron Losses)

These occur in the magnetic core of the transformer and are present as long as the transformer is energized, even without load.

- **Hysteresis Loss:**
 - Caused by the reversal of magnetization in the core during each AC cycle.
 - Depends on the material of the core and the frequency of operation.
 - Formula:

$$P_h = \eta B_{max}^{1.6} f V$$

- **Eddy Current Loss:**

- Caused by circulating currents induced within the core due to changing magnetic fields.
- Minimized by using laminated cores.
- Formula:

$$P_e = K_e B_{max}^2 f^2 t^2 V$$

where K_e = constant, t = thickness of laminations.

Copper Losses (I²R Losses)

These occur due to the resistance of the windings when current flows through them.

- Occur in both the primary and secondary windings.
- Proportional to the square of the load current.
- Formula:

$$P_{cu} = I^2 R$$

where I = current, R = resistance of the winding.

Other Minor Losses (Less Significant)

- **Stray Losses:** Caused by leakage fluxes inducing currents in structural parts.
- **Dielectric Losses:** Occur in the insulating material due to the alternating electric field.
- **Mechanical Losses:** Due to vibrations and noise (rarely significant in electrical calculations).

The **maximum efficiency** of a single-phase transformer occurs when the **variable (copper) losses equal the constant (core) losses**.

Formula for Maximum Efficiency:

$$\eta_{\max} = \frac{V_2 I_2 \cos \phi}{V_2 I_2 \cos \phi + 2P_{\text{core}}}$$

Condition for Maximum Efficiency:

$$P_{\text{cu}} = P_{\text{core}}$$

Corresponding Load (current or kVA) at Maximum Efficiency:

$$I_{\text{max efficiency}} = \sqrt{\frac{P_{\text{core}}}{r_{\text{eq}}}}$$

or

$$S_{\text{max efficiency}} = \sqrt{\frac{P_{\text{core}}}{\text{per-unit copper loss}}} \times S_{\text{rated}}$$

Where:

- P_{core} = iron (core) loss (constant)
- $P_{\text{cu}} = I^2 r_{\text{eq}}$ = copper loss (variable)
- r_{eq} = equivalent resistance referred to one side.

CT-3 Solution

1. (a) The sum of the electrical potential differences (voltages) around any closed loop or mesh in a circuit is equal to zero.

In formula form:

$$\sum_{i=1}^n V_i = 0$$

Where:

1. V_i represents the voltage drop or gain across the i -th element in the loop.
2. The sum is taken over all elements in a closed loop.

(b) Convert $8 + 6j$ to polar form

A complex number in **rectangular form** is:

$$z = x + jy$$

where $x = 8$ and $y = 6$.

Step 1: Calculate the magnitude r

$$r = |z| = \sqrt{x^2 + y^2} = \sqrt{8^2 + 6^2} = \sqrt{64 + 36} = \sqrt{100} = 10$$

Step 2: Calculate the angle (argument θ)

$$\theta = \tan^{-1} \left(\frac{y}{x} \right) = \tan^{-1} \left(\frac{6}{8} \right) = \tan^{-1}(0.75) \approx 36.87^\circ$$

Final Answer (Polar Form):

$$8 + 6j = 10 \angle 36.87^\circ$$

Convert $16 \angle 90^\circ$ to rectangular form

A complex number in **polar form** is:

$$z = r \angle \theta = r(\cos \theta + j \sin \theta)$$

Given:

- $r = 16$
- $\theta = 90^\circ$

$$z = 16(\cos 90^\circ + j \sin 90^\circ) = 16(0 + j \cdot 1) = 16j$$

Final Answer (Rectangular Form):

$$16 \angle 90^\circ = 0 + 16j$$

(c) In a series RLC circuit (Resistor–Inductor–Capacitor in series), resonance occurs when the inductive reactance and capacitive reactance are equal in magnitude but opposite in sign, causing them to cancel each other out. The key conditions and characteristics at series resonance are:

1. Resonant Frequency:

The resonance occurs at a specific frequency f_0 , called the **resonant frequency**, given by:

$$f_0 = \frac{1}{2\pi\sqrt{LC}}$$

Where:

- L = inductance (in henries)
- C = capacitance (in farads)

2. Reactance Cancellation:

At resonance:

$$X_L = X_C \Rightarrow \omega L = \frac{1}{\omega C}$$

This means the total **reactive impedance** is zero:

$$Z = R + j(X_L - X_C) = R + j(0) = R$$

3. Minimum Impedance

At resonance, the total circuit impedance Z is purely resistive and **minimum**:

$$Z = R$$

This causes **maximum current** to flow through the circuit.

4. Maximum Current

Because impedance is minimum, the current is maximum:

$$I_{max} = \frac{V}{R}$$

5. Unity Power Factor

At resonance, the circuit behaves as purely resistive:

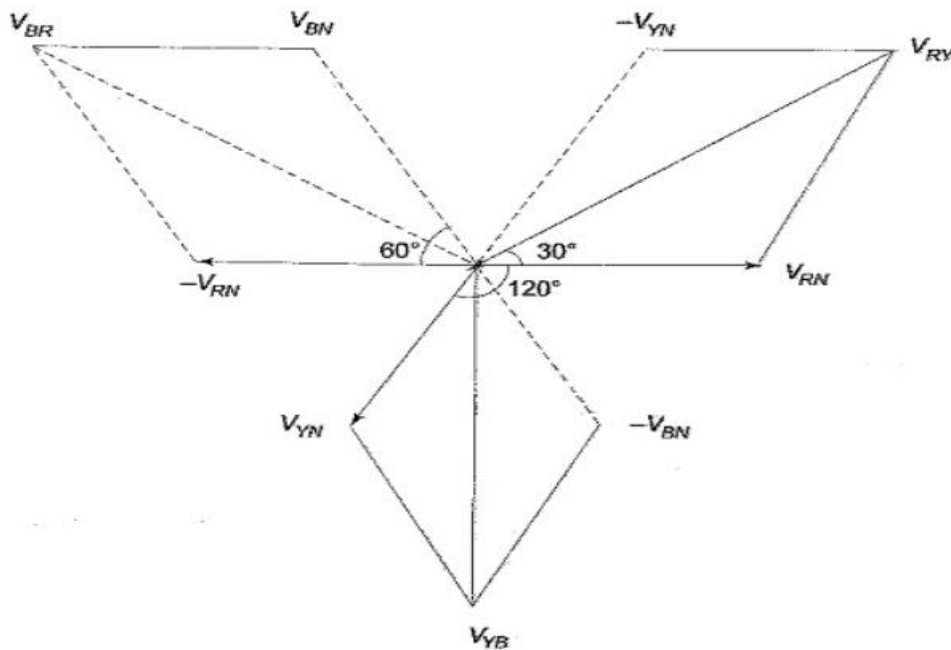
$$\text{Power factor} = \cos(\phi) = 1$$

So, the phase angle $\phi = 0^\circ$, and voltage and current are in phase.

(d)

In a **balanced 3-phase system**, the angle between **line-to-line voltage** and **line-to-phase voltage** is:

$$\boxed{30^\circ}$$



(e) Kirchhoff's Current Law (KCL) states:

The total current entering a junction (or node) in an electrical circuit is equal to the total current leaving the junction.

$$\sum I_{\text{in}} = \sum I_{\text{out}}$$

Or simply:

$$\sum I = 0$$

(Where current entering is taken as positive and current leaving as negative, or vice versa — but be consistent.)

KCL is based on the **law of conservation of electric charge**. Charge cannot accumulate at a node — whatever charge flows into a junction must flow out.

(f) The one-wattmeter method is a simplified approach to measure power in a balanced 3-phase system, but it has several limitations and disadvantages:

- The method is only accurate when the load is balanced (i.e., all three phases carry equal current and have the same impedance).
- It cannot be used for unbalanced systems, which are common in real-world applications.
- The accuracy of the reading depends on knowing the correct phase sequence (i.e., the order of the phases: R, Y, B).
- If the phase sequence is incorrect, the wattmeter reading may be inaccurate or even negative.

(g) Losses in transformers can be broadly classified into two main categories: core losses and copper losses. Here's a breakdown:

Core Losses (Iron Losses)

These occur in the magnetic core of the transformer and are present as long as the transformer is energized, even without load.

- **Hysteresis Loss:**

- Caused by the reversal of magnetization in the core during each AC cycle.
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or

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Where:

- P_{core} = iron (core) loss (constant)
- $P_{\text{cu}} = I^2 r_{\text{eq}}$ = copper loss (variable)
- r_{eq} = equivalent resistance referred to one side.

2 (a)

We are given the following parameters for the DC shunt generator:

- Number of poles, $P = 8$
- Armature conductors, $Z = 778$
- Type of winding: **wave connected** $\Rightarrow$ Number of parallel paths, $A = 2$
- Speed, $N = 500$ rpm
- Load resistance, $R_L = 12.5 \Omega$
- Terminal voltage, $V = 250$ V
- Armature resistance, $R_a = 0.24 \Omega$
- Field (shunt) resistance, $R_f = 250 \Omega$

Step 1: Find the **load current**, I_L

$$I_L = \frac{V}{R_L} = \frac{250}{12.5} = 20 \text{ A}$$

Step 2: Find the **field current**, I_f

$$I_f = \frac{V}{R_f} = \frac{250}{250} = 1 \text{ A}$$

Step 3: Find the **armature current**, I_a

$$I_a = I_L + I_f = 20 + 1 = 21 \text{ A}$$

Step 4: Find the **induced EMF**, E_g

From the armature circuit:

$$E_g = V + I_a R_a = 250 + (21)(0.24) = 250 + 5.04 = 255.04 \text{ V}$$

Step 5: Use EMF equation to find **flux per pole**, ϕ

The EMF equation of a DC generator:

$$E_g = \frac{P\phi ZN}{60A}$$

Rearranged to find ϕ :

$$\phi = \frac{E_g \cdot 60 \cdot A}{P \cdot Z \cdot N}$$

Substitute values:

$$\begin{aligned}\phi &= \frac{255.04 \cdot 60 \cdot 2}{8 \cdot 778 \cdot 500} \\ \phi &= \frac{30604.8}{3112000} \approx 0.00983 \text{ Wb}\end{aligned}$$

- **Armature current**, $I_a = 21 \text{ A}$
- **Induced EMF**, $E_g = 255.04 \text{ V}$
- **Flux per pole**, $\phi \approx 0.00983 \text{ Wb}$

2 (b)

Norton's Theorem – Statement:

"Any two-terminal linear network consisting of voltage sources and resistors can be replaced by an equivalent circuit having a single current source in parallel with a single resistor."

- The **Norton current** I_N is the current that would flow through a short placed across the terminals.
- The **Norton resistance** R_N is the equivalent resistance seen from the load terminals with all independent sources turned off.

We are given a circuit with:

- $R_1 = 50\ \Omega$
- $R_2 = 100\ \Omega$
- $R_3 = 200\ \Omega$ (load resistor across which we apply Norton's Theorem)
- Voltage sources: 8V (left), 10V (middle), and 40V (right)

We need to:

1. Find Norton resistance R_N
2. Find Norton current I_N
3. Determine the value of R_3 for maximum power transfer
4. Calculate the maximum power

Step 1: Remove R_3 and Find R_N

To find R_N , remove R_3 and turn off all independent sources:

- Voltage sources become short circuits.

Now the circuit becomes:

- $R_1 = 50\ \Omega$ in parallel with $R_2 = 100\ \Omega$

So:

$$R_N = R_1 \parallel R_2 = \frac{R_1 \cdot R_2}{R_1 + R_2} = \frac{50 \cdot 100}{50 + 100} = \frac{5000}{150} = 33.33\ \Omega$$

Step 2: Find Norton Current I_N

Reconnect original sources and **short the terminals where R_3 was** to find Norton current.

Use Superposition:

1. Due to 8 V source only:

- 10 V and 40 V sources are replaced by short circuits.
- Circuit becomes 8 V across $R_1 = 50 \Omega$, shorting R_3 means current from left to center.

Current through short:

$$I_{N1} = \frac{8}{50} = 0.16 \text{ A}$$

2. Due to 40 V source only:

- 8 V and 10 V sources are shorted.
- Voltage is 40 V across $R_2 = 100 \Omega$

Current from right to center:

$$I_{N2} = \frac{40}{100} = 0.4 \text{ A}$$

3. Due to 10 V source only:

- 8 V and 40 V are shorted.
- 10 V battery has one end at top node and other at bottom node (between R_1 and R_2) → **no current through short.**

So,

$$I_{N3} = 0$$

Total Norton Current:

From left: 0.16 A

From right: 0.4 A (opposite direction, subtract)

So,

$$I_N = I_{N1} - I_{N2} = 0.16 - 0.4 = -0.24 \text{ A}$$

(Negative sign: actual current flows from right to left)

Use magnitude: $|I_N| = 0.24 \text{ A}$

Step 3: Value of R_3 for Maximum Power Transfer

$$R_3 = R_N = 33.33 \Omega$$

Step 4: Maximum Power Delivered

$$P_{\max} = \frac{I_N^2 \cdot R_N}{4} = \frac{(0.24)^2 \cdot 33.33}{4} = \frac{0.0576 \cdot 33.33}{4} = \frac{1.92}{4} = 0.48 \text{ W}$$

Final Answers:

$R_3 = 33.33 \Omega$ for maximum power transfer

Maximum Power = 0.48 W

Norton Resistance $R_N = 33.33 \Omega$

Norton Current $I_N = 0.24 \text{ A (right to left)}$

3(a)

- Number of poles = 4
- Type of winding: **Lap connected** → irrelevant here unless flux/pole or EMF equation is needed
- Field resistance $R_f = 50 \Omega$
- Armature resistance $R_a = 0.1 \Omega$
- Number of lamps = 60
- Each lamp rating = 100 V, 40 W
- Brush contact drop = **1 V per brush** → total contact drop = **2 V**

Step 1: Load Current

Each lamp consumes:

$$P_{\text{lamp}} = 40 \text{ W}, \quad V_{\text{lamp}} = 100 \text{ V}$$

Total load power:

$$P_{\text{load}} = 60 \times 40 = 2400 \text{ W}$$

Total load current:

$$I_L = \frac{P_{\text{load}}}{V} = \frac{2400}{100} = 24 \text{ A}$$

Step 2: Field Current

$$I_f = \frac{V}{R_f} = \frac{100}{50} = 2 \text{ A}$$

Step 3: Armature Current

$$I_a = I_L + I_f = 24 + 2 = 26 \text{ A}$$

Step 4: Generated EMF E_g

Accounting for voltage drop across armature and brush contact drop:

$$E_g = V + I_a R_a + \text{Brush Drop} = 100 + (26)(0.1) + 2 = 100 + 2.6 + 2 = \boxed{104.6 \text{ V}}$$

Final Answers:

Armature Current $I_a = \boxed{26 \text{ A}}$

Generated EMF $E_g = \boxed{104.6 \text{ V}}$

3 (b)

Step 1: Identify Nodes

Label the essential nodes:

- Let the bottom node be the **reference (ground)** node.
- Let the top left node (between the 8V battery and R_1) be **Node A**.
- Let the middle node (between R_1 , R_2 , R_3 , and 10V battery) be **Node B**.
- Let the top right node (between R_2 and 40V battery) be **Node C**.

We'll find the voltages at **Node A** (V_A), **Node B** (V_B), and **Node C** (V_C) with respect to ground.

Step 2: Assign Known Voltages

- The voltage at **Node A**, just after the 8V source, is:

$$V_A = 8 \text{ V}$$

- The 10V battery between Node A and Node B has positive terminal connected to Node B, so:

$$V_B = V_A + 10 = 8 + 10 = 18 \text{ V}$$

Now apply **nodal analysis** at **Node C** (since A and B are already known).

Step 3: Write KCL at Node C

Currents leaving Node C:

- Through $R_2 = 100\ \Omega$: $\frac{V_C - V_B}{100}$
- Through the 40V source to ground: $\frac{V_C - 40}{0}$ – but this is a voltage source! Instead, treat it as a constraint:
 $V_C = 40\text{ V}$

Thus, no need to do KCL at C because **voltage at C is already known**.

So we now know:

- $V_A = 8\text{ V}$
- $V_B = 18\text{ V}$
- $V_C = 40\text{ V}$

Step 4: Find Currents in All Branches

Current I_1 through $R_1 = 50\ \Omega$:

$$I_1 = \frac{V_B - V_A}{R_1} = \frac{18 - 8}{50} = \frac{10}{50} = 0.2\text{ A}$$

Current I_2 through $R_2 = 100\ \Omega$:

$$I_2 = \frac{V_C - V_B}{R_2} = \frac{40 - 18}{100} = \frac{22}{100} = 0.22\text{ A}$$

Current I_3 through $R_3 = 200\ \Omega$:

$$I_3 = \frac{V_B - 0}{R_3} = \frac{18}{200} = 0.09\text{ A}$$

Final Answers:

- $I_1 = 0.2\text{ A}$ (from Node A to Node B)
- $I_2 = 0.22\text{ A}$ (from Node B to Node C)
- $I_3 = 0.09\text{ A}$ (from Node B to Ground)

Attendance Sheet (Month-wise)- Sec (A)

Attendance for the month of August 2024

		Day	01	02	06	07	08	09	13	16	21	22	23	28	30
		Month	08	08	08	08	08	08	08	08	08	08	08	08	08
Sl.	Enrollment No.	Student Name													
1	TCA2409004	ABHAY RAJ SINGH	P	P	P	P	P		P	P	P	P	P	P	P
2	TCA2409008	ABHISHEK KUMAR	P	P		P	P	P	P	P	P	P	P		P
3	TCA2409026	ANAMTA NAQVI	P	P	P	P	P	P	P	P	P	P	P	P	P
4	TCA2409029	ANIMESH JAIN	P		P	P	P	P	P	P	P	P		P	P
5	TCA2409032	ANKIT KUMAR	P	P	P	P	P	P	P	P	P	P	P	P	P
6	TCA2409042	ANURAG YADAV		P	P	P	P	P	P	P	P		P	P	P
7	TCA2409045	ARCHANA KUMARI	P	P		P	P	P	P	P	P	P	P		P
8	TCA2409048	ARPIT JAIN	P	P	P	P	P	P		P	P	P	P	P	P
9	TCA2409055	ATUL KUMAR GUPTA	P	P	P	P	P	P	P	P	P	P	P	P	P
10	TCA2409058	AYUSH SINGH	P	P	P	P	P	P	P	P	P	P	P	P	P
11	TCA2409061	DAKSH RUHELA	P	P	P	P	P	P	P	P	P	P	P	P	P
12	TCA2409073	HARSH JAIN	P	P	P	P	P	P	P		P	P	P	P	P
13	TCA2409075	HARSHIT JAIN	P	P	P	P	P	P		P	P	P	P	P	P
14	TCA2409076	HARSHIT JAIN	P	P	P	P		P	P	P	P	P	P	P	P
15	TCA2409081	HRITHIK PAWAR	P	P		P	P	P	P	P	P	P	P		P
16	TCA2409084	JAY RAM KUMAR MANDAL	P		P	P	P	P	P	P	P	P		P	P
17	TCA2409086	KAMAL		P	P	P	P	P	P	P	P		P	P	P
18	TCA2409087	KARTIK KUMAR SINGH	P		P	P	P	P	P	P	P	P		P	P
19	TCA2409089	KRATI JAIN	P	P		P	P	P	P	P	P	P	P		P
20	TCA2409092	LAKSHYA GAHLOUT	P	P	P	P		P	P	P	P	P	P	P	P
21	TCA2409100	MANYUPMA KUMARI	P	P	P	P	P	P		P	P	P	P	P	P
22	TCA2409106	MOHAMMAD AMAAN	P	P	P	P	P	P	P	P		P	P	P	P
23	TCA2409111	MOHD AYAN	P	P	P	P	P	P	P	P	P	P	P	P	P
24	TCA2409116	NIKSHAY JAIN	P	P	P	P	P	P	P	P	P	P	P	P	P
25	TCA2409119	OMPRAKASH	P	P	P	P	P	P	P	P		P	P	P	P

26	TCA2409122	PANKAJ KUMAR	P	P	P	P	P	P		P	P	P	P	P	P
27	TCA2409124	PARTH JAIN	P	P	P	P		P	P	P	P	P	P	P	P
28	TCA2409127	PRAJJAWAL SINGH	P	P		P	P	P	P	P	P	P	P		P
29	TCA2409128	PRAPHOOL KUMAR		P	P	P	P	P	P	P	P		P	P	P
30	TCA2409131	PRINCE KUMAR PATEL	P	P	P	P		P	P	P	P	P	P	P	P
31	TCA2409135	PUNEET CHAUHAN	P	P	P	P	P	P		P	P	P	P	P	P
32	TCA2409139	RANJEET KUMAR	P	P	P	P	P	P	P	P		P	P	P	P
33	TCA2409155	SEHWAG GOUR	P	P	P	P	P	P	P	P	P	P	P	P	P
34	TCA2409166	SNEHA JAIN	P	P	P	P	P	P	P	P	P	P	P	P	P
35	TCA2409167	SONU KUMAR	P	P	P	P	P	P	P	P	P	P	P	P	P
36	TCA2409171	TANISH CHAUHAN	P	P	P	P	P	P	P	P		P	P	P	P
37	TCA2409172	TANZILA BASIR	P	P	P	P	P	P	P		P	P	P	P	P
38	TCA2409176	UTKARSH CHAUHAN	P	P	P	P	P	P	P	P	P	P	P	P	P
39	TCA2409185	VINAYAK AGRAHARI	P	P	P	P	P	P	P	P	P	P	P	P	P
40	TCA2409187	VISHVAMOHAN SHARMA	P	P	P	P	P	P	P	P		P	P	P	P
41	TCA2409005	ABHIMANYU RAI	P	P	P	P	P		P	P	P	P	P	P	P
42	TCA2409006	ABHINAV SUNIL PATIL	P	P		P	P	P	P	P	P	P	P		P
43	TCA2409010	ABHISHEK SHUKLA	P	P	P	P	P	P	P	P	P	P	P	P	P
44	TCA2409013	ADI JAIN	P		P	P	P	P	P	P	P	P		P	P
45	TCA2409020	AKSHITA JAIN	P	P	P	P	P	P	P	P	P	P	P	P	P
46	TCA2409021	AMAAN SHAHID		P	P	P	P	P	P	P	P		P	P	P
47	TCA2409022	AMAN THAPAN	P	P		P	P	P	P	P	P	P	P		P
48	TCA2409025	AMRUTA VILAS HUDDAR	P	P	P	P	P	P		P	P	P	P	P	P
49	TCA2409030	ANIMESH JAIN	P	P	P	P	P	P	P	P	P	P	P	P	P
50	TCA2409033	ANKIT KUMAR	P	P	P	P	P	P	P	P	P	P	P	P	P
51	TCA2409034	ANKIT KUMAR	P	P	P	P	P	P	P	P	P	P	P	P	P
52	TCA2409038	ANSH JAIN	P	P	P	P	P	P	P		P	P	P	P	P
53	TCA2409039	ANSHIK KUMAR GUPTA	P	P	P	P	P	P		P	P	P	P	P	P
54	TCA2409049	ARUN	P	P	P	P		P	P	P	P	P	P	P	P
55	TCA2409050	ARUN KUMAR	P	P		P	P	P	P	P	P	P	P		P
56	TCA2409053	ASHUTOSH KUMAR RAI	P		P	P	P	P	P	P	P	P		P	P
57	TCA2409056	AVADHESH KUMAR SHARMA		P	P	P	P	P	P	P	P		P	P	P

58	TCA2409064	DIVYANSH BHARDWAJ	P		P	P	P	P	P	P	P	P		P	P
59	TCA2409067	GAGANDEEP SHARMA	P	P		P	P	P	P	P	P	P	P		P
60	TCA2409072	GYAYAK PATODI	P	P	P	P		P	P	P	P	P	P	P	P

Attendance for the month of September 2024

		Day	04	06	10	12	13	04	17	18	04	20	26
		Month	09	09	09	09	09	09	09	09	09	09	09
Sl.	Enrollment No.	Student Name											
1	TCA2409004	ABHAY RAJ SINGH	P	P	P	P	P		P	P	P	P	P
2	TCA2409008	ABHISHEK KUMAR	P	P		P	P	P	P	P	P	P	P
3	TCA2409026	ANAMTA NAQVI	P	P	P	P	P	P	P	P	P	P	P
4	TCA2409029	ANIMESH JAIN	P		P	P	P	P	P	P	P	P	P
5	TCA2409032	ANKIT KUMAR	P	P	P	P	P	P	P	P	P	P	P
6	TCA2409042	ANURAG YADAV		P	P	P	P	P	P	P	P	P	P
7	TCA2409045	ARCHANA KUMARI	P	P		P	P	P	P	P	P	P	P
8	TCA2409048	ARPIT JAIN	P	P	P	P	P	P		P	P	P	P
9	TCA2409055	ATUL KUMAR GUPTA	P	P	P	P	P	P	P	P	P	P	P
10	TCA2409058	AYUSH SINGH	P	P	P	P	P	P	P	P	P	P	P
11	TCA2409061	DAKSH RUHELA	P	P	P	P	P	P	P	P	P	P	P
12	TCA2409073	HARSH JAIN	P	P	P	P	P	P	P		P		P
13	TCA2409075	HARSHIT JAIN	P	P	P	P	P	P		P	P	P	P
14	TCA2409076	HARSHIT JAIN	P	P	P	P		P	P	P	P	P	P
15	TCA2409081	HRITHIK PAWAR	P	P		P	P	P	P	P	P	P	P
16	TCA2409084	JAY RAM KUMAR MANDAL	P		P	P	P	P	P	P	P	P	P
17	TCA2409086	KAMAL		P	P	P	P	P	P	P	P	P	P
18	TCA2409087	KARTIK KUMAR SINGH	P		P	P	P	P	P	P	P	P	P
19	TCA2409089	KRATI JAIN	P	P		P	P	P	P	P	P	P	P
20	TCA2409092	LAKSHYA GAHLOUT	P	P	P	P		P	P	P	P	P	P

21	TCA2409100	MANYUPMA KUMARI	P	P	P	P	P	P		P	P	P	P
22	TCA2409106	MOHAMMAD AMAAN	P	P	P	P	P	P	P	P		P	
23	TCA2409111	MOHD AYAN	P	P	P	P	P	P	P	P	P	P	P
24	TCA2409116	NIKSHAY JAIN	P	P	P	P	P	P	P	P	P	P	P
25	TCA2409119	OMPRAKASH	P	P	P	P	P	P	P	P		P	
26	TCA2409122	PANKAJ KUMAR	P	P	P	P	P	P		P	P	P	P
27	TCA2409124	PARTH JAIN	P	P	P	P		P	P	P	P	P	P
28	TCA2409127	PRAJJAWAL SINGH	P	P		P	P	P	P	P	P	P	P
29	TCA2409128	PRAPHOOL KUMAR		P	P	P	P	P	P	P	P	P	P
30	TCA2409131	PRINCE KUMAR PATEL	P	P	P	P		P	P	P	P	P	P
31	TCA2409135	PUNEET CHAUHAN	P	P	P	P	P	P		P	P	P	P
32	TCA2409139	RANJEET KUMAR	P	P	P	P	P	P	P	P		P	
33	TCA2409155	SEHWAG GOUR	P	P	P	P	P	P	P	P	P	P	P
34	TCA2409166	SNEHA JAIN	P	P	P	P	P	P	P	P	P	P	P
35	TCA2409167	SONU KUMAR	P	P	P	P	P	P	P	P	P	P	P
36	TCA2409171	TANISH CHAUHAN	P	P	P	P	P	P	P	P		P	
37	TCA2409172	TANZILA BASIR	P	P	P	P	P	P	P		P		P
38	TCA2409176	UTKARSH CHAUHAN	P	P	P	P	P	P	P	P	P	P	P
39	TCA2409185	VINAYAK AGRAHARI	P	P	P	P	P	P	P	P	P	P	P
40	TCA2409187	VISHVAMOHAN SHARMA	P	P	P	P	P	P	P	P		P	
41	TCA2409005	ABHIMANYU RAI	P	P	P	P	P		P	P	P	P	P
42	TCA2409006	ABHINAV SUNIL PATIL	P	P		P	P	P	P	P	P	P	P
43	TCA2409010	ABHISHEK SHUKLA	P	P	P	P	P	P	P	P	P	P	P
44	TCA2409013	ADI JAIN	P		P	P	P	P	P	P	P	P	P
45	TCA2409020	AKSHITA JAIN	P	P	P	P	P	P	P	P	P	P	P
46	TCA2409021	AMAAN SHAHID		P	P	P	P	P	P	P	P	P	P
47	TCA2409022	AMAN THAPAN	P	P		P	P	P	P	P	P	P	P
48	TCA2409025	AMRUTA VILAS HUDDAR	P	P	P	P	P	P		P	P	P	P
49	TCA2409030	ANIMESH JAIN	P	P	P	P	P	P	P	P	P	P	P
50	TCA2409033	ANKIT KUMAR	P	P	P	P	P	P	P	P	P	P	P
51	TCA2409034	ANKIT KUMAR	P	P	P	P	P	P	P	P	P	P	P
52	TCA2409038	ANSH JAIN	P	P	P	P	P	P	P		P		P

53	TCA2409039	ANSHIK KUMAR GUPTA	P	P	P	P	P	P		P	P	P	P
54	TCA2409049	ARUN	P	P	P	P		P	P	P	P	P	P
55	TCA2409050	ARUN KUMAR	P	P		P	P	P	P	P	P	P	P
56	TCA2409053	ASHUTOSH KUMAR RAI	P		P	P	P	P	P	P	P	P	P
57	TCA2409056	AVADHESH KUMAR SHARMA		P	P	P	P	P	P	P	P	P	P
58	TCA2409064	DIVYANSH BHARDWAJ	P		P	P	P	P	P	P	P	P	P
59	TCA2409067	GAGANDEEP SHARMA	P	P		P	P	P	P	P	P	P	P
60	TCA2409072	GYAYAK PATODI	P	P	P	P		P	P	P	P	P	P

Attendance for the month of October 2024

		Day	01	03	04	08	09	22	23	24	25	29
		Month	10	10	10	10	10	10	10	10	10	10
Sl.	Enrollment No.	Student Name										
1	TCA2409004	ABHAY RAJ SINGH	P	P	P	P	P		P	P	P	P
2	TCA2409008	ABHISHEK KUMAR	P	P		P	P	P	P	P	P	
3	TCA2409026	ANAMTA NAQVI	P	P	P	P	P	P	P	P	P	P
4	TCA2409029	ANIMESH JAIN	P		P	P	P	P	P	P	P	P
5	TCA2409032	ANKIT KUMAR	P	P	P	P	P	P	P	P	P	P
6	TCA2409042	ANURAG YADAV		P	P	P	P	P	P	P	P	P
7	TCA2409045	ARCHANA KUMARI	P	P		P	P	P	P	P	P	
8	TCA2409048	ARPIT JAIN	P	P	P	P	P	P		P	P	P
9	TCA2409055	ATUL KUMAR GUPTA	P	P	P	P	P	P	P	P	P	P
10	TCA2409058	AYUSH SINGH	P	P	P	P	P	P	P	P	P	P
11	TCA2409061	DAKSH RUHELA	P	P	P	P	P	P	P	P	P	P
12	TCA2409073	HARSH JAIN	P	P	P	P	P	P	P		P	P
13	TCA2409075	HARSHIT JAIN	P	P	P	P	P	P		P	P	P
14	TCA2409076	HARSHIT JAIN	P	P	P	P		P	P	P	P	P
15	TCA2409081	HRITHIK PAWAR	P	P		P	P	P	P	P	P	
16	TCA2409084	JAY RAM KUMAR MANDAL	P		P	P	P	P	P	P	P	P
17	TCA2409086	KAMAL		P	P	P	P	P	P	P	P	P
18	TCA2409087	KARTIK KUMAR SINGH	P		P	P	P	P	P	P	P	P

19	TCA2409089	KRATI JAIN	P	P		P	P	P	P	P	P	
20	TCA2409092	LAKSHYA GAHLOUT	P	P	P	P		P	P	P	P	P
21	TCA2409100	MANYUPMA KUMARI	P	P	P	P	P	P		P	P	P
22	TCA2409106	MOHAMMAD AMAAN	P	P	P	P	P	P	P	P		P
23	TCA2409111	MOHD AYAN	P	P	P	P	P	P	P	P	P	P
24	TCA2409116	NIKSHAY JAIN	P	P	P	P	P	P	P	P	P	P
25	TCA2409119	OMPRAKASH	P	P	P	P	P	P	P	P		P
26	TCA2409122	PANKAJ KUMAR	P	P	P	P	P	P		P	P	P
27	TCA2409124	PARTH JAIN	P	P	P	P		P	P	P	P	P
28	TCA2409127	PRAJJAWAL SINGH	P	P		P	P	P	P	P	P	
29	TCA2409128	PRAPHOOL KUMAR		P	P	P	P	P	P	P	P	P
30	TCA2409131	PRINCE KUMAR PATEL	P	P	P	P		P	P	P	P	P
31	TCA2409135	PUNEET CHAUHAN	P	P	P	P	P	P		P	P	P
32	TCA2409139	RANJEET KUMAR	P	P	P	P	P	P	P	P		P
33	TCA2409155	SEHWAG GOUR	P	P	P	P	P	P	P	P	P	P
34	TCA2409166	SNEHA JAIN	P	P	P	P	P	P	P	P	P	P
35	TCA2409167	SONU KUMAR	P	P	P	P	P	P	P	P	P	P
36	TCA2409171	TANISH CHAUHAN	P	P	P	P	P	P	P	P		P
37	TCA2409172	TANZILA BASIR	P	P	P	P	P	P	P		P	P
38	TCA2409176	UTKARSH CHAUHAN	P	P	P	P	P	P	P	P	P	P
39	TCA2409185	VINAYAK AGRAHARI	P	P	P	P	P	P	P	P	P	P
40	TCA2409187	VISHVAMOHAN SHARMA	P	P	P	P	P	P	P	P		P
41	TCA2409005	ABHIMANYU RAI	P	P	P	P	P		P	P	P	P
42	TCA2409006	ABHINAV SUNIL PATIL	P	P		P	P	P	P	P	P	
43	TCA2409010	ABHISHEK SHUKLA	P	P	P	P	P	P	P	P	P	P
44	TCA2409013	ADI JAIN	P		P	P	P	P	P	P	P	P
45	TCA2409020	AKSHITA JAIN	P	P	P	P	P	P	P	P	P	P
46	TCA2409021	AMAAN SHAHID		P	P	P	P	P	P	P	P	P
47	TCA2409022	AMAN THAPAN	P	P		P	P	P	P	P	P	
48	TCA2409025	AMRUTA VILAS HUDDAR	P	P	P	P	P	P		P	P	P
49	TCA2409030	ANIMESH JAIN	P	P	P	P	P	P	P	P	P	P
50	TCA2409033	ANKIT KUMAR	P	P	P	P	P	P	P	P	P	P

51	TCA2409034	ANKIT KUMAR	P	P	P	P	P	P	P	P	P	P
52	TCA2409038	ANSH JAIN	P	P	P	P	P	P	P		P	P
53	TCA2409039	ANSHIK KUMAR GUPTA	P	P	P	P	P	P		P	P	P
54	TCA2409049	ARUN	P	P	P	P		P	P	P	P	P
55	TCA2409050	ARUN KUMAR	P	P		P	P	P	P	P	P	
56	TCA2409053	ASHUTOSH KUMAR RAI	P		P	P	P	P	P	P	P	P
57	TCA2409056	AVADHESH KUMAR SHARMA		P	P	P	P	P	P	P	P	P
58	TCA2409064	DIVYANSH BHARDWAJ	P		P	P	P	P	P	P	P	P
59	TCA2409067	GAGANDEEP SHARMA	P	P		P	P	P	P	P	P	
60	TCA2409072	GYAYAK PATODI	P	P	P	P		P	P	P	P	P

Attendance for the month of November 2024

		Day	05	06	12	13	14	26	27	28	29
		Month	11	11	11	11	11	11	11	11	11
Sl.	Enrollment No.	Student Name									
1	TCA2409004	ABHAY RAJ SINGH	P	P	P	P	P		P	P	P
2	TCA2409008	ABHISHEK KUMAR	P	P		P	P	P	P	P	P
3	TCA2409026	ANAMTA NAQVI	P	P	P	P	P	P	P	P	P
4	TCA2409029	ANIMESH JAIN	P		P	P	P	P	P	P	P
5	TCA2409032	ANKIT KUMAR	P	P	P	P	P	P	P	P	P
6	TCA2409042	ANURAG YADAV		P	P	P	P	P	P	P	P
7	TCA2409045	ARCHANA KUMARI	P	P		P	P	P	P	P	P
8	TCA2409048	ARPIT JAIN	P	P	P	P	P	P		P	P
9	TCA2409055	ATUL KUMAR GUPTA	P	P	P	P	P	P	P	P	P
10	TCA2409058	AYUSH SINGH	P	P	P	P	P	P	P	P	P
11	TCA2409061	DAKSH RUHELA	P	P	P	P	P	P	P	P	P
12	TCA2409073	HARSH JAIN	P	P	P	P	P	P	P		P
13	TCA2409075	HARSHIT JAIN	P	P	P	P	P	P		P	P
14	TCA2409076	HARSHIT JAIN	P	P	P	P		P	P	P	P
15	TCA2409081	HRITHIK PAWAR	P	P		P	P	P	P	P	P
16	TCA2409084	JAY RAM KUMAR MANDAL	P		P	P	P	P	P	P	P

17	TCA2409086	KAMAL		P	P	P	P	P	P	P	P	P
18	TCA2409087	KARTIK KUMAR SINGH	P		P	P	P	P	P	P	P	P
19	TCA2409089	KRATI JAIN	P	P		P	P	P	P	P	P	P
20	TCA2409092	LAKSHYA GAHLOUT	P	P	P	P		P	P	P	P	P
21	TCA2409100	MANYUPMA KUMARI	P	P	P	P	P	P		P	P	
22	TCA2409106	MOHAMMAD AMAAN	P	P	P	P	P	P	P	P	P	
23	TCA2409111	MOHD AYAN	P	P	P	P	P	P	P	P	P	P
24	TCA2409116	NIKSHAY JAIN	P	P	P	P	P	P	P	P	P	P
25	TCA2409119	OMPRAKASH	P	P	P	P	P	P	P	P	P	
26	TCA2409122	PANKAJ KUMAR	P	P	P	P	P	P		P	P	
27	TCA2409124	PARTH JAIN	P	P	P	P		P	P	P	P	P
28	TCA2409127	PRAJJAWAL SINGH	P	P		P	P	P	P	P	P	P
29	TCA2409128	PRAPHOOL KUMAR		P	P	P	P	P	P	P	P	P
30	TCA2409131	PRINCE KUMAR PATEL	P	P	P	P		P	P	P	P	P
31	TCA2409135	PUNEET CHAUHAN	P	P	P	P	P	P		P	P	
32	TCA2409139	RANJEET KUMAR	P	P	P	P	P	P	P	P	P	
33	TCA2409155	SEHWAG GOUR	P	P	P	P	P	P	P	P	P	P
34	TCA2409166	SNEHA JAIN	P	P	P	P	P	P	P	P	P	P
35	TCA2409167	SONU KUMAR	P	P	P	P	P	P	P	P	P	P
36	TCA2409171	TANISH CHAUHAN	P	P	P	P	P	P	P	P	P	
37	TCA2409172	TANZILA BASIR	P	P	P	P	P	P	P	P		P
38	TCA2409176	UTKARSH CHAUHAN	P	P	P	P	P	P	P	P	P	P
39	TCA2409185	VINAYAK AGRAHARI	P	P	P	P	P	P	P	P	P	P
40	TCA2409187	VISHVAMOHAN SHARMA	P	P	P	P	P	P	P	P	P	
41	TCA2409005	ABHIMANYU RAI	P	P	P	P	P		P	P	P	
42	TCA2409006	ABHINAV SUNIL PATIL	P	P		P	P	P	P	P	P	P
43	TCA2409010	ABHISHEK SHUKLA	P	P	P	P	P	P	P	P	P	P
44	TCA2409013	ADI JAIN	P		P	P	P	P	P	P	P	P
45	TCA2409020	AKSHITA JAIN	P	P	P	P	P	P	P	P	P	P
46	TCA2409021	AMAAN SHAHID		P	P	P	P	P	P	P	P	P
47	TCA2409022	AMAN THAPAN	P	P		P	P	P	P	P	P	P
48	TCA2409025	AMRUTA VILAS HUDDAR	P	P	P	P	P	P		P	P	

49	TCA2409030	ANIMESH JAIN	P	P	P	P	P	P	P	P	P	P
50	TCA2409033	ANKIT KUMAR	P	P	P	P	P	P	P	P	P	P
51	TCA2409034	ANKIT KUMAR	P	P	P	P	P	P	P	P	P	P
52	TCA2409038	ANSH JAIN	P	P	P	P	P	P	P			P
53	TCA2409039	ANSHIK KUMAR GUPTA	P	P	P	P	P	P			P	P
54	TCA2409049	ARUN	P	P	P	P		P	P	P	P	P
55	TCA2409050	ARUN KUMAR	P	P		P	P	P	P	P	P	P
56	TCA2409053	ASHUTOSH KUMAR RAI	P		P	P	P	P	P	P	P	P
57	TCA2409056	AVADHESH KUMAR SHARMA		P	P	P	P	P	P	P	P	P
58	TCA2409064	DIVYANSH BHARDWAJ	P		P	P	P	P	P	P	P	P
59	TCA2409067	GAGANDEEP SHARMA	P	P		P	P	P	P	P	P	P
60	TCA2409072	GYAYAK PATODI	P	P	P	P		P	P	P	P	P

Attendance Sheet (Month-wise)- Sec (B)

Attendance for the month of August 2024

		Day	01	02	05	06	08	09	12	13	16	22	23	29	30
		Month	08	08	08	08	08	08	08	08	08	08	08	08	08
Sl.	Enrollment No.	Student Name													
1	TCA2409078	HIMANSHU JAIN	P	P	P	P	P		P	P	P	P	P	P	P
2	TCA2409095	MAHAK JAIN	P	P		P	P	P	P	P	P	P	P		P
3	TCA2409096	MANAS MADHAV	P	P	P	P	P	P	P	P	P	P	P	P	P
4	TCA2409097	MANISEN GUPTA	P		P	P	P	P	P	P	P	P		P	P
5	TCA2409105	MISHIKA JAIN	P	P	P	P	P	P	P	P	P	P	P	P	P
6	TCA2409114	NAVED ALAM		P	P	P	P	P	P	P	P		P	P	P
7	TCA2409115	NIKET JAIN	P	P		P	P	P	P	P	P	P	P		P
8	TCA2409129	PRATEEK JAIN	P	P	P	P	P	P		P	P	P	P	P	P
9	TCA2409130	PRINCE JAIN	P	P	P	P	P	P	P	P	P	P	P	P	P
10	TCA2409138	RADHIKA VERMA	P	P	P	P	P	P	P	P	P	P	P	P	P
11	TCA2409143	RIDDHI JAIN	P	P	P	P	P	P	P	P	P	P	P	P	P

12	TCA2409148	SAMEER	P	P	P	P	P	P	P		P	P	P	P	P
13	TCA2409149	SAMYAK JAIN	P	P	P	P	P	P		P	P	P	P	P	P
14	TCA2409150	SANSKAR PATIL	P	P	P	P		P	P	P	P	P	P	P	P
15	TCA2409158	SHALABH CHAUDHARY	P	P		P	P	P	P	P	P	P	P		P
16	TCA2409159	SHASHANK KUMAR MISHRA	P		P	P	P	P	P	P	P	P		P	P
17	TCA2409160	SHEETAL		P	P	P	P	P	P	P	P		P	P	P
18	TCA2409162	SHIVANG YADAV	P		P	P	P	P	P	P	P	P		P	P
19	TCA2409175	URJA JAIN	P	P		P	P	P	P	P	P	P	P		P
20	TCA2409182	VANSH KUMAR	P	P	P	P		P	P	P	P	P	P	P	P
21	TCA2409193	ZAINAB AYYOOB	P	P	P	P	P	P		P	P	P	P	P	P
22	TCA2409001	ABDUL MUNEEB KHAN	P	P	P	P	P	P	P	P		P	P	P	P
23	TCA2409002	ABDUS SUBOOR KHAN	P	P	P	P	P	P	P	P	P	P	P	P	P
24	TCA2409007	ABHISHEK JAIN	P	P	P	P	P	P	P	P	P	P	P	P	P
25	TCA2409016	AJAY KUMAR	P	P	P	P	P	P	P	P		P	P	P	P
26	TCA2409027	ANAND MISHRA	P	P	P	P	P	P		P	P	P	P	P	P
27	TCA2409028	ANAND RAJ	P	P	P	P		P	P	P	P	P	P	P	P
28	TCA2409037	ANSH CHAUDHARY	P	P		P	P	P	P	P	P	P	P		P
29	TCA2409041	ANUJ PAL		P	P	P	P	P	P	P	P		P	P	P
30	TCA2409044	ANVI JAIN	P	P	P	P		P	P	P	P	P	P	P	P
31	TCA2409047	ARPAN KUMAR	P	P	P	P	P	P		P	P	P	P	P	P
32	TCA2409052	ASHUTOSH KUMAR	P	P	P	P	P	P	P	P		P	P	P	P
33	TCA2409059	AZHAAN MOHAMMAD KHAN	P	P	P	P	P	P	P	P	P	P	P	P	P
34	TCA2409060	DAKSH JAIN	P	P	P	P	P	P	P	P	P	P	P	P	P
35	TCA2409066	DIVYANSHU KUMAR	P	P	P	P	P	P	P	P	P	P	P	P	P
36	TCA2409077	HEMANT CHAHAL	P	P	P	P	P	P	P	P		P	P	P	P
37	TCA2409083	JAMSHED ALAM	P	P	P	P	P	P	P		P	P	P	P	P
38	TCA2409091	KRISH PAL	P	P	P	P	P	P	P	P	P	P	P	P	P
39	TCA2409099	MANYA JAIN	P	P	P	P	P	P	P	P	P	P	P	P	P
40	TCA2409107	MOHAMMAD FAIZ	P	P	P	P	P	P	P	P		P	P	P	P
41	TCA2409109	MOHAMMAD HANZALA GAZI	P	P	P	P	P		P	P	P	P	P	P	P
42	TCA2409112	MUSKAN	P	P		P	P	P	P	P	P	P	P		P
43	TCA2409113	NAMAN JAIN	P	P	P	P	P	P	P	P	P	P	P	P	P

44	TCA2409120	PALAK JAIN	P		P	P	P	P	P	P	P	P		P	P
45	TCA2409121	PALAK SHARMA	P	P	P	P	P	P	P	P	P	P	P	P	P
46	TCA2409125	PARTH SHARMA		P	P	P	P	P	P	P	P		P	P	P
47	TCA2409132	PRITAN KUMAR	P	P		P	P	P	P	P	P	P	P		P
48	TCA2409137	RADHIKA	P	P	P	P	P	P		P	P	P	P	P	P
49	TCA2409146	ROCKEY RAJ	P	P	P	P	P	P	P	P	P	P	P	P	P
50	TCA2409152	SATYAM JAIN	P	P	P	P	P	P	P	P	P	P	P	P	P
51	TCA2409156	SHAFIA KHATOON	P	P	P	P	P	P	P	P	P	P	P	P	P
52	TCA2409161	SHIMPU	P	P	P	P	P	P	P		P	P	P	P	P
53	TCA2409164	SHREYA PANDEY	P	P	P	P	P	P		P	P	P	P	P	P
54	TCA2409169	SRISTI RANI	P	P	P	P		P	P	P	P	P	P	P	P
55	TCA2409177	UTKARSH GUPTA	P	P		P	P	P	P	P	P	P	P		P
56	TCA2409179	VANDANA KUMARI	P		P	P	P	P	P	P	P	P		P	P
57	TCA2409181	VANSH JAIN		P	P	P	P	P	P	P	P		P	P	P
58	TCA2409183	VARSHA	P		P	P	P	P	P	P	P	P		P	P
59	TCA2409189	VISHWAS RASTOGI	P	P		P	P	P	P	P	P	P	P		P
60	TCA2409190	VIVEK YADAV	P	P	P	P		P	P	P	P	P	P	P	P

Attendance for the month of September 2024

		Day	05	06	09	10	12	13	19	20	23	24	26
		Month	09	09	09	09	09	09	09	09	09	09	09
Sl.	Enrollment No.	Student Name											
1	TCA2409078	HIMANSHU JAIN	P	P	P	P	P		P	P	P	P	P
2	TCA2409095	MAHAK JAIN	P	P		P	P	P	P	P	P	P	P
3	TCA2409096	MANAS MADHAV	P	P	P	P	P	P	P	P	P	P	P
4	TCA2409097	MANISEN GUPTA	P		P	P	P	P	P	P	P	P	P
5	TCA2409105	MISHIKA JAIN	P	P	P	P	P	P	P	P	P	P	P
6	TCA2409114	NAVED ALAM		P	P	P	P	P	P	P	P	P	P
7	TCA2409115	NIKET JAIN	P	P		P	P	P	P	P	P	P	P
8	TCA2409129	PRATEEK JAIN	P	P	P	P	P	P		P	P		P
9	TCA2409130	PRINCE JAIN	P	P	P	P	P	P	P	P	P	P	P

10	TCA2409138	RADHIKA VERMA	P	P	P	P	P	P	P	P	P	P	P
11	TCA2409143	RIDDHI JAIN	P	P	P	P	P	P	P	P	P	P	P
12	TCA2409148	SAMEER	P	P	P	P	P	P	P		P	P	
13	TCA2409149	SAMYAK JAIN	P	P	P	P	P	P		P	P		P
14	TCA2409150	SANSKAR PATIL	P	P	P	P		P	P	P	P	P	P
15	TCA2409158	SHALABH CHAUDHARY	P	P		P	P	P	P	P	P	P	P
16	TCA2409159	SHASHANK KUMAR MISHRA	P		P	P	P	P	P	P	P	P	P
17	TCA2409160	SHEETAL		P	P	P	P	P	P	P	P	P	P
18	TCA2409162	SHIVANG YADAV	P		P	P	P	P	P	P	P	P	P
19	TCA2409175	URJA JAIN	P	P		P	P	P	P	P	P	P	P
20	TCA2409182	VANSH KUMAR	P	P	P	P		P	P	P	P	P	P
21	TCA2409193	ZAINAB AYYOOB	P	P	P	P	P	P		P	P		P
22	TCA2409001	ABDUL MUNEEB KHAN	P	P	P	P	P	P	P	P		P	P
23	TCA2409002	ABDUS SUBOOR KHAN	P	P	P	P	P	P	P	P	P	P	P
24	TCA2409007	ABHISHEK JAIN	P	P	P	P	P	P	P	P	P	P	P
25	TCA2409016	AJAY KUMAR	P	P	P	P	P	P	P	P		P	P
26	TCA2409027	ANAND MISHRA	P	P	P	P	P	P		P	P		P
27	TCA2409028	ANAND RAJ	P	P	P	P		P	P	P	P	P	P
28	TCA2409037	ANSH CHAUDHARY	P	P		P	P	P	P	P	P	P	P
29	TCA2409041	ANUJ PAL		P	P	P	P	P	P	P	P	P	P
30	TCA2409044	ANVI JAIN	P	P	P	P		P	P	P	P	P	P
31	TCA2409047	ARPAN KUMAR	P	P	P	P	P	P		P	P		P
32	TCA2409052	ASHUTOSH KUMAR	P	P	P	P	P	P	P	P		P	P
33	TCA2409059	AZHAAN MOHAMMAD KHAN	P	P	P	P	P	P	P	P	P	P	P
34	TCA2409060	DAKSH JAIN	P	P	P	P	P	P	P	P	P	P	P
35	TCA2409066	DIVYANSHU KUMAR	P	P	P	P	P	P	P	P	P	P	P
36	TCA2409077	HEMANT CHAHAL	P	P	P	P	P	P	P	P		P	P
37	TCA2409083	JAMSHED ALAM	P	P	P	P	P	P	P		P	P	
38	TCA2409091	KRISH PAL	P	P	P	P	P	P	P	P	P	P	P
39	TCA2409099	MANYA JAIN	P	P	P	P	P	P	P	P	P	P	P
40	TCA2409107	MOHAMMAD FAIZ	P	P	P	P	P	P	P	P		P	P
41	TCA2409109	MOHAMMAD HANZALA GAZI	P	P	P	P	P		P	P	P	P	P

42	TCA2409112	MUSKAN	P	P		P	P	P	P	P	P	P	P
43	TCA2409113	NAMAN JAIN	P	P	P	P	P	P	P	P	P	P	P
44	TCA2409120	PALAK JAIN	P		P	P	P	P	P	P	P	P	P
45	TCA2409121	PALAK SHARMA	P	P	P	P	P	P	P	P	P	P	P
46	TCA2409125	PARTH SHARMA		P	P	P	P	P	P	P	P	P	P
47	TCA2409132	PRITAN KUMAR	P	P		P	P	P	P	P	P	P	P
48	TCA2409137	RADHIKA	P	P	P	P	P	P		P	P		P
49	TCA2409146	ROCKEY RAJ	P	P	P	P	P	P	P	P	P	P	P
50	TCA2409152	SATYAM JAIN	P	P	P	P	P	P	P	P	P	P	P
51	TCA2409156	SHAFIA KHATOON	P	P	P	P	P	P	P	P	P	P	P
52	TCA2409161	SHIMPU	P	P	P	P	P	P	P		P	P	
53	TCA2409164	SHREYA PANDEY	P	P	P	P	P	P		P	P		P
54	TCA2409169	SRISTI RANI	P	P	P	P		P	P	P	P	P	P
55	TCA2409177	UTKARSH GUPTA	P	P		P	P	P	P	P	P	P	P
56	TCA2409179	VANDANA KUMARI	P		P	P	P	P	P	P	P	P	P
57	TCA2409181	VANSH JAIN		P	P	P	P	P	P	P	P	P	P
58	TCA2409183	VARSHA	P		P	P	P	P	P	P	P	P	P
59	TCA2409189	VISHWAS RASTOGI	P	P		P	P	P	P	P	P	P	P
60	TCA2409190	VIVEK YADAV	P	P	P	P		P	P	P	P	P	P

Attendance for the month of October 2024

		Day	01	03	04	07	10	21	22	24	25	29
		Month	10	10	10	10	10	10	10	10	10	10
Sl.	Enrollment No.	Student Name										
1	TCA2409078	HIMANSHU JAIN	P	P	P	P	P		P	P	P	P
2	TCA2409095	MAHAK JAIN	P	P		P	P	P	P	P	P	P
3	TCA2409096	MANAS MADHAV	P	P	P	P	P	P	P	P	P	P
4	TCA2409097	MANISEN GUPTA	P		P	P	P	P	P	P	P	P
5	TCA2409105	MISHIKA JAIN	P	P	P	P	P	P	P	P	P	P
6	TCA2409114	NAVED ALAM		P	P	P	P	P	P	P	P	
7	TCA2409115	NIKET JAIN	P	P		P	P	P	P	P	P	P

8	TCA2409129	PRATEEK JAIN	P	P	P	P	P	P		P	P	P
9	TCA2409130	PRINCE JAIN	P	P	P	P	P	P	P	P	P	P
10	TCA2409138	RADHIKA VERMA	P	P	P	P	P	P	P	P	P	P
11	TCA2409143	RIDDHI JAIN	P	P	P	P	P	P	P	P	P	P
12	TCA2409148	SAMEER	P	P	P	P	P	P	P		P	P
13	TCA2409149	SAMYAK JAIN	P	P	P	P	P	P		P	P	P
14	TCA2409150	SANSKAR PATIL	P	P	P	P		P	P	P	P	P
15	TCA2409158	SHALABH CHAUDHARY	P	P		P	P	P	P	P	P	P
16	TCA2409159	SHASHANK KUMAR MISHRA	P		P	P	P	P	P	P	P	P
17	TCA2409160	SHEETAL		P	P	P	P	P	P	P	P	
18	TCA2409162	SHIVANG YADAV	P		P	P	P	P	P	P	P	P
19	TCA2409175	URJA JAIN	P	P		P	P	P	P	P	P	P
20	TCA2409182	VANSH KUMAR	P	P	P	P		P	P	P	P	P
21	TCA2409193	ZAINAB AYYOOB	P	P	P	P	P	P		P	P	P
22	TCA2409001	ABDUL MUNEEB KHAN	P	P	P	P	P	P	P	P		P
23	TCA2409002	ABDUS SUBOOR KHAN	P	P	P	P	P	P	P	P	P	P
24	TCA2409007	ABHISHEK JAIN	P	P	P	P	P	P	P	P	P	P
25	TCA2409016	AJAY KUMAR	P	P	P	P	P	P	P	P		P
26	TCA2409027	ANAND MISHRA	P	P	P	P	P	P		P	P	P
27	TCA2409028	ANAND RAJ	P	P	P	P		P	P	P	P	P
28	TCA2409037	ANSH CHAUDHARY	P	P		P	P	P	P	P	P	P
29	TCA2409041	ANUJ PAL		P	P	P	P	P	P	P	P	
30	TCA2409044	ANVI JAIN	P	P	P	P		P	P	P	P	P
31	TCA2409047	ARPAN KUMAR	P	P	P	P	P	P		P	P	P
32	TCA2409052	ASHUTOSH KUMAR	P	P	P	P	P	P	P	P		P
33	TCA2409059	AZHAAN MOHAMMAD KHAN	P	P	P	P	P	P	P	P	P	P
34	TCA2409060	DAKSH JAIN	P	P	P	P	P	P	P	P	P	P
35	TCA2409066	DIVYANSHU KUMAR	P	P	P	P	P	P	P	P	P	P
36	TCA2409077	HEMANT CHAHAL	P	P	P	P	P	P	P	P		P
37	TCA2409083	JAMSHED ALAM	P	P	P	P	P	P	P		P	P
38	TCA2409091	KRISH PAL	P	P	P	P	P	P	P	P	P	P
39	TCA2409099	MANYA JAIN	P	P	P	P	P	P	P	P	P	P

40	TCA2409107	MOHAMMAD FAIZ	P	P	P	P	P	P	P	P		P
41	TCA2409109	MOHAMMAD HANZALA GAZI	P	P	P	P	P		P	P	P	P
42	TCA2409112	MUSKAN	P	P		P	P	P	P	P	P	P
43	TCA2409113	NAMAN JAIN	P	P	P	P	P	P	P	P	P	P
44	TCA2409120	PALAK JAIN	P		P	P	P	P	P	P	P	P
45	TCA2409121	PALAK SHARMA	P	P	P	P	P	P	P	P	P	P
46	TCA2409125	PARTH SHARMA		P	P	P	P	P	P	P	P	
47	TCA2409132	PRITAN KUMAR	P	P		P	P	P	P	P	P	P
48	TCA2409137	RADHIKA	P	P	P	P	P	P		P	P	P
49	TCA2409146	ROCKEY RAJ	P	P	P	P	P	P	P	P	P	P
50	TCA2409152	SATYAM JAIN	P	P	P	P	P	P	P	P	P	P
51	TCA2409156	SHAFIA KHATOON	P	P	P	P	P	P	P	P	P	P
52	TCA2409161	SHIMPU	P	P	P	P	P	P	P		P	P
53	TCA2409164	SHREYA PANDEY	P	P	P	P	P	P		P	P	P
54	TCA2409169	SRISTI RANI	P	P	P	P		P	P	P	P	P
55	TCA2409177	UTKARSH GUPTA	P	P		P	P	P	P	P	P	P
56	TCA2409179	VANDANA KUMARI	P		P	P	P	P	P	P	P	P
57	TCA2409181	VANSH JAIN		P	P	P	P	P	P	P	P	
58	TCA2409183	VARSHA	P		P	P	P	P	P	P	P	P
59	TCA2409189	VISHWAS RASTOGI	P	P		P	P	P	P	P	P	P
60	TCA2409190	VIVEK YADAV	P	P	P	P		P	P	P	P	P

Attendance for the month of November 2024

		Day	05	07	11	12	14	26	28	29
		Month	11	11	11	11	11	11	11	11
Sl.	Enrollment No.	Student Name								
1	TCA2409078	HIMANSHU JAIN	P	P	P	P	P		P	P
2	TCA2409095	MAHAK JAIN	P	P		P	P	P	P	P
3	TCA2409096	MANAS MADHAV	P	P	P	P	P	P	P	P
4	TCA2409097	MANISEN GUPTA	P		P	P	P	P	P	P
5	TCA2409105	MISHIKA JAIN	P	P	P	P	P	P	P	P

6	TCA2409114	NAVED ALAM		P	P	P	P	P	P	P
7	TCA2409115	NIKET JAIN	P	P		P	P	P	P	P
8	TCA2409129	PRATEEK JAIN	P	P	P	P	P	P		P
9	TCA2409130	PRINCE JAIN	P	P	P	P	P	P	P	P
10	TCA2409138	RADHIKA VERMA	P	P	P	P	P	P	P	P
11	TCA2409143	RIDDHI JAIN	P	P	P	P	P	P	P	P
12	TCA2409148	SAMEER	P	P	P	P	P	P	P	
13	TCA2409149	SAMYAK JAIN	P	P	P	P	P	P		P
14	TCA2409150	SANSKAR PATIL	P	P	P	P		P	P	P
15	TCA2409158	SHALABH CHAUDHARY	P	P		P	P	P	P	P
16	TCA2409159	SHASHANK KUMAR MISHRA	P		P	P	P	P	P	P
17	TCA2409160	SHEETAL		P	P	P	P	P	P	P
18	TCA2409162	SHIVANG YADAV	P		P	P	P	P	P	P
19	TCA2409175	URJA JAIN	P	P		P	P	P	P	P
20	TCA2409182	VANSH KUMAR	P	P	P	P		P	P	P
21	TCA2409193	ZAINAB AYYOOB	P	P	P	P	P	P		P
22	TCA2409001	ABDUL MUNEEB KHAN	P	P	P	P	P	P	P	P
23	TCA2409002	ABDUS SUBOOR KHAN	P	P	P	P	P	P	P	P
24	TCA2409007	ABHISHEK JAIN	P	P	P	P	P	P	P	P
25	TCA2409016	AJAY KUMAR	P	P	P	P	P	P	P	P
26	TCA2409027	ANAND MISHRA	P	P	P	P	P	P		P
27	TCA2409028	ANAND RAJ	P	P	P	P		P	P	P
28	TCA2409037	ANSH CHAUDHARY	P	P		P	P	P	P	P
29	TCA2409041	ANUJ PAL		P	P	P	P	P	P	P
30	TCA2409044	ANVI JAIN	P	P	P	P		P	P	P
31	TCA2409047	ARPAN KUMAR	P	P	P	P	P	P		P
32	TCA2409052	ASHUTOSH KUMAR	P	P	P	P	P	P	P	P
33	TCA2409059	AZHAAN MOHAMMAD KHAN	P	P	P	P	P	P	P	P
34	TCA2409060	DAKSH JAIN	P	P	P	P	P	P	P	P
35	TCA2409066	DIVYANSHU KUMAR	P	P	P	P	P	P	P	P
36	TCA2409077	HEMANT CHAHAL	P	P	P	P	P	P	P	P
37	TCA2409083	JAMSHED ALAM	P	P	P	P	P	P	P	

38	TCA2409091	KRISH PAL	P	P	P	P	P	P	P	P
39	TCA2409099	MANYA JAIN	P	P	P	P	P	P	P	P
40	TCA2409107	MOHAMMAD FAIZ	P	P	P	P	P	P	P	P
41	TCA2409109	MOHAMMAD HANZALA GAZI	P	P	P	P	P		P	P
42	TCA2409112	MUSKAN	P	P		P	P	P	P	P
43	TCA2409113	NAMAN JAIN	P	P	P	P	P	P	P	P
44	TCA2409120	PALAK JAIN	P		P	P	P	P	P	P
45	TCA2409121	PALAK SHARMA	P	P	P	P	P	P	P	P
46	TCA2409125	PARTH SHARMA		P	P	P	P	P	P	P
47	TCA2409132	PRITAN KUMAR	P	P		P	P	P	P	P
48	TCA2409137	RADHIKA	P	P	P	P	P	P		P
49	TCA2409146	ROCKEY RAJ	P	P	P	P	P	P	P	P
50	TCA2409152	SATYAM JAIN	P	P	P	P	P	P	P	P
51	TCA2409156	SHAFIA KHATOON	P	P	P	P	P	P	P	P
52	TCA2409161	SHIMPU	P	P	P	P	P	P	P	
53	TCA2409164	SHREYA PANDEY	P	P	P	P	P	P		P
54	TCA2409169	SRISTI RANI	P	P	P	P		P	P	P
55	TCA2409177	UTKARSH GUPTA	P	P		P	P	P	P	P
56	TCA2409179	VANDANA KUMARI	P		P	P	P	P	P	P
57	TCA2409181	VANSH JAIN		P	P	P	P	P	P	P
58	TCA2409183	VARSHA	P		P	P	P	P	P	P
59	TCA2409189	VISHWAS RASTOGI	P	P		P	P	P	P	P
60	TCA2409190	VIVEK YADAV	P	P	P	P		P	P	P

Identification of Slow Learners after CT1

1.	TCA2409004	ABHAY RAJ SINGH	12
2.	TCA2409008	ABHISHEK KUMAR	2
3.	TCA2409042	ANURAG YADAV	12
4.	TCA2409076	HARSHIT JAIN	10
5.	TCA2409081	HRITHIK PAWAR	12
6.	TCA2409084	JAY RAM KUMAR MANDAL	10

7.	TCA2409087	KARTIK KUMAR SINGH	7
8.	TCA2409092	LAKSHYA GAHLOUT	14
9.	TCA2409127	PRAJJAWAL SINGH	10
10.	TCA2409128	PRAPHOOL KUMAR	12
11.	TCA2409131	PRINCE KUMAR PATEL	11
12.	TCA2409167	SONU KUMAR	2
13.	TCA2409171	TANISH CHAUHAN	9
14.	TCA2409185	VINAYAK AGRAHARI	8
15.	TCA2409187	VISHVAMOHAN SHARMA	3
16.	TCA2409005	ABHIMANYU RAI	9
17.	TCA2409021	AMAAN SHAHID	9
18.	TCA2409022	AMAN THAPAN	9
19.	TCA2409049	TCA2409049	10
20.	TCA2409049	TCA2409049	12
21.	TCA2409064	DIVYANSH BHARDWAJ	7
22.	TCA2409072	GYAYAK PATODI	14
23.	TCA2409129	PRATEEK JAIN	10
24.	TCA2409130	PRINCE JAIN	12
25.	TCA2409138	RADHIKA VERMA	11
26.	TCA2409193	ZAINAB AYYOOB	10
27.	TCA2409041	ANUJ PAL	0
28.	TCA2409060	DAKSH JAIN	9
29.	TCA2409099	MANYA JAIN	7
30.	TCA2409109	MOHAMMAD HANZALA GAZI	14

Identification of Slow Learners after CT2

1.	TCA2409004	ABHAY RAJ SINGH	12
2.	TCA2409131	PRINCE KUMAR PATEL	12
3.	TCA2409155	SEHWAG GOUR	12
4.	TCA2409166	SNEHA JAIN	10

5.	TCA2409167	SONU KUMAR	14
6.	TCA2409185	VINAYAK AGRAHARI	14
7.	TCA2409049	ARUN	12
8.	TCA2409114	NAVED ALAM	9
9.	TCA2409138	RADHIKA VERMA	12
10.	TCA2409149	SAMYAK JAIN	12
11.	TCA2409150	SANSKAR PATIL	14
12.	TCA2409158	SHALABH CHAUDHARY	14
13.	TCA2409193	ZAINAB AYYOOB	0
14.	TCA2409169	SRISTI RANI	14

Identification of Slow Learners after CT3

1.	TCA2409029	ANIMESH JAIN	2
2.	TCA2409055	ATUL KUMAR GUPTA	11
3.	TCA2409061	DAKSH RUHELA	9
4.	TCA2409081	HRITHIK PAWAR	2
5.	TCA2409111	MOHD AYAN	8
6.	TCA2409030	ANIMESH JAIN	11
7.	TCA2409034	ANKIT KUMAR	9
8.	TCA2409050	ARUN KUMAR	2
9.	TCA2409096	MANAS MADHAV	8

Special classes with attendance sheet of slow learners with ATR after CT-I

- Topics have been identified for slow learners after CT-1 as given below
 - Numerical problems based on Thevenin's theorem, Norton's theorem and Maximum power transfer theorem
 - Numerical problems based on Mesh & Nodal Analysis
- After special/remedial classes circular, classes had been taken as per below attendance sheet

Attendance Sheet

Classes for Slow Learners After First CT	Date/Month
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S.NO.	Enrollment No.	Name	26/10	02/11	09/10	16/10
1	TCA2409004	ABHAY RAJ SINGH	P	P	A	P
2	TCA2409008	ABHISHEK KUMAR	P	P	P	P
3	TCA2409042	ANURAG YADAV	P	P	P	P
4	TCA2409076	HARSHIT JAIN	P	P	P	P
5	TCA2409081	HRITHIK PAWAR	P	A	P	P
6	TCA2409084	JAY RAM KUMAR MANDAL	A	P	P	P
7	TCA2409087	KARTIK KUMAR SINGH	P	P	A	P
8	TCA2409092	LAKSHYA GAHLOUT	P	P	P	P
9	TCA2409127	PRAJJAWAL SINGH	P	A	P	P
10	TCA2409128	PRAPHOOL KUMAR	P	P	P	A
11	TCA2409131	PRINCE KUMAR PATEL	P	A	P	P
12	TCA2409167	SONU KUMAR	P	P	P	P
13	TCA2409171	TANISH CHAUHAN	P	A	P	P
14	TCA2409185	VINAYAK AGRAHARI	P	P	A	P
15	TCA2409187	VISHVAMOHAN SHARMA	P	A	P	P
16	TCA2409005	ABHIMANYU RAI	P	A	A	P
17	TCA2409021	AMAAN SHAHID	P	P	P	P
18	TCA2409022	AMAN THAPAN	P	A	P	A
19	TCA2409049	TCA2409049	A	P	P	P
20	TCA2409049	TCA2409049	P	A	P	A
21	TCA2409064	DIVYANSH BHARDWAJ	P	P	P	P
22	TCA2409072	GYAYAK PATODI	A	P	A	P
23	TCA2409129	PRATEEK JAIN	P	A	P	P
24	TCA2409130	PRINCE JAIN	P	P	A	P
25	TCA2409138	RADHIKA VERMA	P	A	P	P

26	TCA2409193	ZAINAB AYYOOB	A	P	P	P
27	TCA2409041	ANUJ PAL	A	P	P	A
28	TCA2409060	DAKSH JAIN	P	A	P	P
29	TCA2409099	MANYA JAIN	P	A	A	P
30	TCA2409109	MOHAMMAD HANZALA GAZI	A	A	P	P

Special classes with attendance sheet of slow learners with ATR after CT-II

- Topics have been identified for slow learners after CT-2 as given below
 - Three phase power measurement using two wattmeter method with numerical problems
 - Relation of line voltages and phase voltages in three phase systems
 - Numerical problems on steady state AC networks analysis.
- After special/remedial classes circular, classes had been taken as per below attendance sheet

Classes for Slow Learners After Second CT			Date/Month			
S.NO.	Enrollment No.	Name	23/11	27/11	30/11	02/12
1	TCA2409004	ABHAY RAJ SINGH	P	P	P	P
2	TCA2409131	PRINCE KUMAR PATEL	P	A	P	P
3	TCA2409155	SEHWAG GOUR	P	P	P	A
4	TCA2409166	SNEHA JAIN	A	P	P	P
5	TCA2409167	SONU KUMAR	P	A	P	P
6	TCA2409185	VINAYAK AGRAHARI	A	P	A	P
7	TCA2409049	ARUN	P	P	P	P
8	TCA2409114	NAVED ALAM	P	P	P	P
9	TCA2409138	RADHIKA VERMA	P	A	P	P
10	TCA2409149	SAMYAK JAIN	P	P	A	A
11	TCA2409150	SANSKAR PATIL	P	A	P	P
12	TCA2409158	SHALABH CHAUDHARY	A	P	P	P

13	TCA2409193	ZAINAB AYYOOB	P	A	P	P
14	TCA2409169	SRISTI RANI	P	P	P	P

Special classes with attendance sheet of slow learners with ATR after CT-III

- Topics have been identified for slow learners after CT-3 as given below
 - EMF and torque equations of DC generator and motor with some numerical problems
 - Phasor diagram of transformers on different loading conditions, basic numerical problems on transformers.
- After special/remedial classes circular, classes had been taken as per below attendance

Classes for Slow Learners After Third CT			Date/Month			
S.NO.	Enrollment No.	Name	16/12	19/12	21/11	23/12
1	TCA2409029	ANIMESH JAIN	P	P	P	A
2	TCA2409055	ATUL KUMAR GUPTA	A	P	P	A
3	TCA2409061	DAKSH RUHELA	P	P	A	A
4	TCA2409081	HRITHIK PAWAR	P	P	P	P
5	TCA2409111	MOHD AYAN	P	P	P	P
6	TCA2409030	ANIMESH JAIN	P	P	P	A
7	TCA2409034	ANKIT KUMAR	P	A	P	P
8	TCA2409050	ARUN KUMAR	P	P	A	A
9	TCA2409096	MANAS MADHAV	P	A	P	P

Previous Year Question Papers

B.Tech I (First) Semester Examination 2023-24

Course Code: EEE117/ EEE101

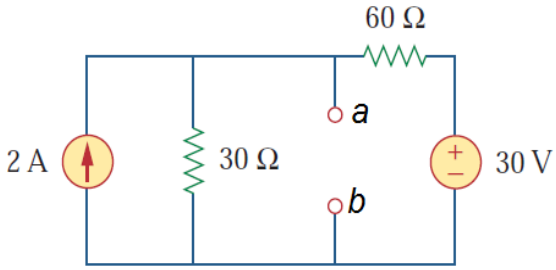
Paper ID: 09623107 Basic Electrical

Engineering

Time: 3 Hours

Max. Marks: 60

Note: Attempt **all** questions (Question paper has total **six** questions).

Q1.	Answer the following (limit your answer to 50 words):	Marks
a)	Why superposition theorem can't be used for calculation of power?	2
	Or	
	How line and phase voltages are related in a star and delta connected system?	2
b)	A series circuit has $R = 10\Omega$, $L = 0.02H$ and $C = 3\mu F$. Calculate Q-factor of the circuit.	2
	Or	
	Two ac currents one represented as $i_1 = 25 \sin(314t + 200)$ & $i_2 = 35 \sin(314t + 450)$. Draw the phasor & show the resultant when they are connected in parallel.	2
c)	What do you understand by active and reactive power in a three phase system?	2
	Or	
	Explain eddy current damping in the measuring instruments.	2
d)	What are the various losses occurring in a transformer and how can they be minimized?	2
	Or	
	Draw the phasor diagram of an ideal transformer at no load.	2
e)	List the application of DC motors.	2
	Or	
	Three loads, each of resistance 30 ohm, are connected in star to a 415 V, 3-phase supply. Determine the system phase voltage.	2
2.	a) Evaluate Thevenin's equivalent parameters for the given circuit in figure. b) If a load resistance R_L is connected between terminal a-b, evaluate the maximum power which can be delivered to the load. 	5+5=10
	Or	
	A coil connected to a 240 V, 50 Hz supply has a resistance of 4Ω and an inductance of 9.55mH. Calculate, a) the impedance	3+3+4=10

	b) the current drawn c) Phase angle between the supply voltage and current	
3.	Explain the following terms in detail a) Phase representation of sinusoids b) Bandwidth and Quality Factor	5+5=10
	Or	
	A 40 μ F capacitor in series with a coil of resistance 8 Ω and inductance 80mH is connected to a 200 V, 100 Hz supply. Calculate: a) the circuit impedance b) the current flowing c) the phase angle between voltage and current d) the voltage across the coil e) the voltage across the capacitor	2x5=10
4.	What is the accuracy and resolution of an instrument? Briefly explain the working of induction type energy meter.	10
	Or	
	Explain two wattmeter methods for three phase power measurement, also draw the necessary phasor diagram and circuit.	10
5.	A 220/440V, 10kVA, 50Hz, single phase transformer has copper loss of 120W at full load. If it has an efficiency of 98% at full load, unity power factor, determine a) The iron losses. b) Efficiency of transformer at half load, 0.8 p.f lagging. c) The transformer loading at maximum efficiency.	3+3+4=10
	Or	
	Derive expression for induced emf in a transformer and thus show that emf induced per turn will remain same for primary and secondary winding.	10
6.	Derive the emf equation of DC generator and also Identify the construction of DC machines.	10
	Or	
	Derive the torque equation of DC motor also identify types of DC machine. Explain any one of them in brief.	10

B.Tech I (First) Semester Examination 2022-23

Course Code: EEE117/EEE101

Paper ID: 09622107

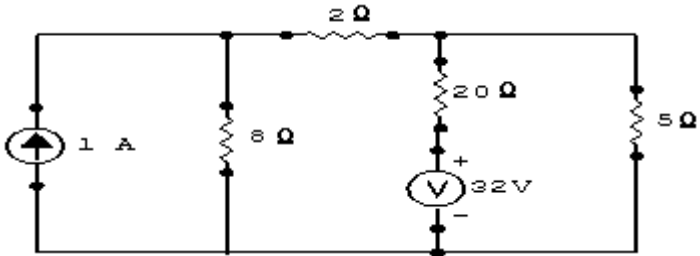
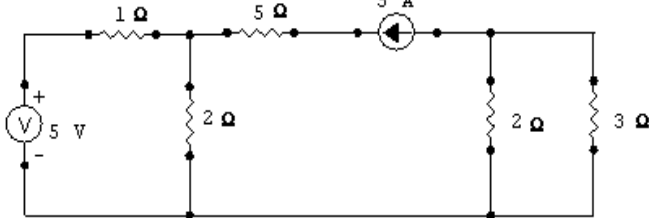
Basic Electrical Engineering

Time: 3 Hours

Max. Marks: 60

Note: Attempt **all** questions.

Q1.	Answer the following (limit your answer to 50 words):	Marks
a)	Define with examples: (i) Active and Passive element (ii) Bilateral and Unilateral elements.	2
	Or	

	Explain (i) Ideal current source (ii) Ideal voltage source.	2
b)	A series circuit has $R = 10\Omega$, $L = 0.02H$ and $C = 3\mu F$. Calculate Q-factor of circuit.	2
	Or	
	Two ac currents one represented as $i_1 = 25 \sin(314t + 20^\circ)$ & $i_2 = 35 \sin(314t + 45^\circ)$. Draw the phasor and show the resultant when they are connected in parallel.	2
c)	Differentiate wattmeter and energy meter.	2
	Or	
	Calculate the energy consumption per day in a house using 5 CFLs of 20 W each, 3 fans of 60 W each for 3 hrs a day.	2
d)	What will happen if the primary of a transformer is connected to dc supply?	2
	Or	
	What are the different types of losses in transformer.	2
e)	How can we change the direction of rotation of DC motor?	2
	Or	
	Write the emf equation of dc machine.	2
2.	Identify the current through 2Ω resistance using superposition theorem in figure.	10
		
	Or	
	Identify current across 3 ohm resistance using loop analysis.	10
		
3.	A series circuit consists of a resistance of 10Ω and inductance of $50mH$ and a variable capacitance in series across a $100V$, $50Hz$ supply. Calculate: a) The value of capacitance to produce resonance b) Voltage across the capacitance c) Q-factor	3+3+4=10
	Or	
	Derive resonance frequency for series RLC circuit.	10
4.	A Balanced Y – connected load is supplied from 3 – Φ , $400V$ AC source. The current in each phase is $30A$ with lagging power factor at 30° . Find Impedance in each phase and total power drawn.	10
	Or	
	Find the relationship between line and phase parameters of delta connected three phase supply system.	10

5.	Explain the principle of operation and construction of single phase transformer. Classify the types of transformer.	10
	Or	
	Draw the equivalent circuit of single phase transformer. Simplify the same to an approximate equivalent circuit.	10
6.	Find the EMF equation of DC Generator. An 8 pole lap wound dc generator has 450 armature turns. It operates at 0.02 wb flux per pole and runs at 1000 rpm at no load. Find the emf induced.	10
	Or	
	A DC shunt motor runs at 600 RPM taking 60 A from 230 V DC supply. Armature resistance is $0.2\ \Omega$ and field resistance is $115\ \Omega$. Find the speed when current through the armature is 30 A.	10

B.Tech I (First) Semester Examination 2021-22

Course Code: EEE117/EEE101

Paper ID: 09619107

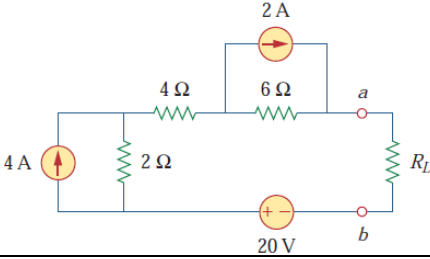
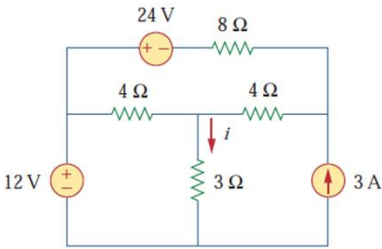
Basic Electrical Engineering

Time: 3 Hours

Max. Marks: 60

Note: Attempt **all** questions.

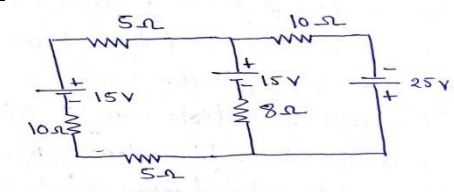
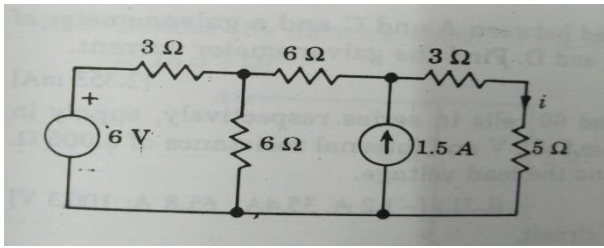
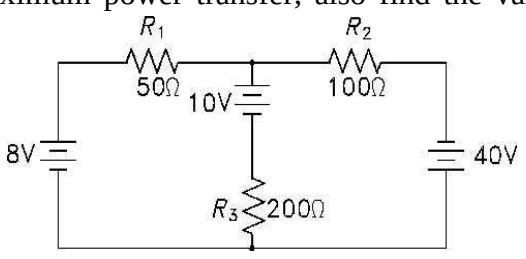
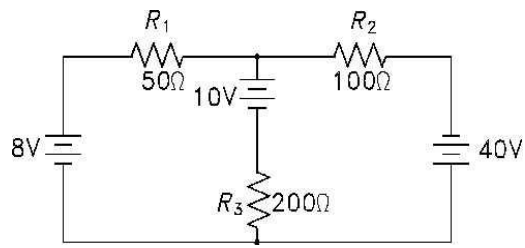
Q1.	Answer the following (limit your answer to 50 words):	Marks
a)	Define with examples: (i) Active and passive element (ii) bilateral and unilateral elements.	2
	Or	
	Explain (i) Ideal current source (ii) ideal voltage source.	2
b)	A coil of inductance 80 mH and resistance $60\ \Omega$ is connected to a 200 V, 100 Hz supply. Calculate the circuit impedance and the current taken from the supply.	2
	Or	
	What do you mean by resonance in a series RLC circuit?	2
c)	What is the basic difference between wattmeter and energy meter.	2
	Or	
	What do you mean by creeping error in energy meter? How it can be avoided?	2
d)	What will happen if the primary of a transformer is connected to dc supply?	2
	Or	
	What are the advantages of auto-transformer over two winding transformer?	2
e)	Describe the emf equation of DC machine.	2

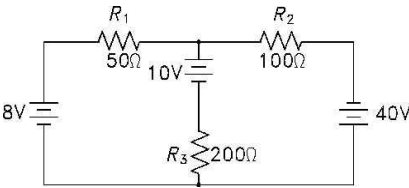
	Or	
	Relate speed, torque and flux in a DC machine.	2
2.	For the circuit in the given Figure, obtain the Thevenin's equivalent at terminals a-b: a) Calculate the current in load resistance for $R_L=8\Omega$ b) Find R_L for maximum power deliverable to load c) Determine that maximum power. 	3+3+4=10
	Or	
	Use superposition theorem to find i in the given circuit. 	10
3.	A 110-V rms, 60-Hz source is applied to a load impedance Z. The apparent power entering the load is 120 VA at a power factor of 0.707 lagging: a) Calculate the complex power b) Find the rms current supplied to the load. c) Determine Z d) Assuming that $Z = R + jX_L$, find the values of R and L.	2.5x4=10
	Or	
	Derive expression of resonance frequency for series RLC circuit. A series circuit consists of a resistance of 10Ω, and inductance of 50mH and a variable capacitance in series across a 100V, 50Hz supply. Calculate- (i) The value of capacitance to produce resonance. (ii) Voltage across the capacitance. (iii) Q-factor.	4+2+2+2=10
4.	Explain with the help of neat diagram, construction and working of energy meter.	10
	Or	
	Derive necessary expression to the extend range of: a) Ammeter b) Voltmeter	5+5=10
5.	A 500 kVA transformer has a full load copper loss of 4 kW and an iron loss of 2.5 kW. Determine (a) the output kVA at which the efficiency of the transformer is maximum, and (b) the maximum efficiency, assuming the power factor of the load is 0.75.	5+5=10
	Or	
	a) Discuss the principle of operation of a single phase transformer. Derive EMF equation for a single phase transformer.: b) What is voltage Regulation in a single Phase Transformer? What should be its value for an ideal transformer?	5+5=10

6.	Classify different type of dc machines with neat circuit diagram.	10
	Or	
	Derive from the electromagnetic induction, the emf equation of dc machine.	10

Question Bank

	Unit I (Short questions) – 2 marks each	Marks
i)	Explain Linear and Non-Linear elements with example.	2
ii)	What is Kirchoff's voltage law?	2
iii)	Explain active and passive elements	2
iv)	How can you convert a current source into voltage source? give an example	2
v)	Explain Kirchoff's current law	2
vi)	Explain Unilateral and Bilateral elements with example.	2
	Unit I (Long questions) – 10 marks each	
i)	In the following circuit find the current in 8 ohm resistance using Mesh analysis.	10

		
ii)	State and prove maximum power transfer theorem. Derive the expression for maximum power also.	10
iii)	State superposition theorem. Find the current in 5ohm resistance using superposition theorem. 	10
iv)	Give the Statement of Nortons Theorem with circuit diagram. What will be the value of R_3 for maximum power transfer, also find the value of maximum power 	10
v)	Give the statement of Thevenins theorem with circuit diagram. In following circuit find the current through R_3 using Thevenin's theorem 	10

vi)	In the following circuit find the current in all the branches using Nodal analysis. 	10
	Unit II (Short questions) – 2 marks each	2
i)	Convert $8+6j$ in to polar form and $16\angle 90^\circ$ into rectangular form.	2
ii)	Determine the Average value, RMS Value, Form Factor and Peak Factor value for a sinusoidal waveform with maximum amplitude of 20 volts.	2
iii)	Write the significant conditions of series resonance.	2
iv)	What is the value of Power factor in case of pure resistance, Inductance and capacitance circuits?	2
v)	Determine the Average value, RMS Value, Form Factor and Peak Factor value for a sinusoidal waveform with maximum amplitude of 20 volts.	2
vi)	Give Circuit diagram of ideal and practical voltage source and current source.	2
	Unit II (Long questions) – 10 marks each	
i)	Show that in a pure inductive circuit average power consumed over one cycle is zero and current lags behind the voltage by 90° .	10
ii)	A coil having resistance of 6Ω and inductance 0.080 is connected across 220V, 50Hz supply. find the current drawn from the supply, power factor, voltage across each element and average power consumed in the circuit.	10

iii)	Derive the formula for average power consumed in RLC circuit. Also give the types of power in ac circuits with formula and unit.	10
iv)	Show that in a pure inductive circuit average power consumed over one cycle is zero and current lags behind the voltage by 90° .	10
v)	Derive the formula for resonant frequency in series R-L-C circuit. A series RLC circuit has $R=100\Omega$, $L=0.318H$ and $C=31.8$ micro farad. Find resonance frequency, supply current if supply voltage is $230\sqrt{2}\sin\omega t$ at 50Hz frequency.	10
vi)	A series R-C circuit is connected to 400V,50hz supply. Find the value of C if the power absorbed by the resistor be 500W at 150V. What is the energy stored in the capacitor?	10
	Unit III (Short questions) – 2 marks each	
i)	What is the angle between line to line and line to phase voltage in 3-phase system, draw phasor diagram also.	2
ii)	What are the disadvantages of one wattmeter method for power measurement in 3 phase system?	2
iii)	In a 2-Wattmeter method of power measurement in 3-phase system, what is the phase angle and load power factor if one wattmeter reads zero?	2
iv)	What are different types of measuring instruments? explain in brief	2
v)	Give the types of torques essential for indicating instruments.	2
vi)	Give the types of errors in single phase energy meter.	2

	Unit III (Long questions) – 10 marks each	
i)	Explain the working principle, construction, advantages, and disadvantages of PMMC instruments with neat circuit diagram.	10
ii)	Derive the relation between phase voltage and line voltage in a 3- phase Star connected system. A balanced star connected load of $8+j6$ ohm per phase is connected to a balanced 3-phase 400 volt supply, find the line current and power factor.	10
iii)	Explain the working and operation of Energy Meter with proper diagram. Also enumerate the errors in it.	10
iv)	i Derive the line and phase voltage relationship of star connection? ii) Derive the line and phase current relationship of Delta connection?	10
v)	Explain the two wattmeter method for three phase power measurement? Derive the formula of power factor in terms of wattmeter readings.	10
vi)	Explain how the range of ammeter and voltmeter can be extended with the help of shunt and multiplier.	10
	Unit IV (Short questions) – 2 marks each	
i)	What are the different kind of Transformer losses? Enumerate and explain.	2
ii)	Explain the working principal of Transformer?	2
iii)	Give the formula for maximum efficiency and corresponding load for a single-phase transformer	2
iv)	A 80 KVA, 3200/400 watt transformer has 111 turns on secondary. Calculate no. of turns on primary winding	2
v)	Can transformer work with dc supply? Justify your answer.	2
vi)	Give the features of an ideal transformer with circuit diagram.	2
	Unit IV (Long questions) – 10 marks each	
i)	Explain the working of single-phase transformer with circuit diagram. Drive the emf equation of single-phase transformer	10

ii)	Derive the formula for maximum efficiency for a single-phase transformer. In a 25KVA, 2000/200V, single phase transformer the iron and copper losses are 200 and 100 watt respectively calculate the efficiency at half load and 0.8 power factor, also find the load at which the efficiency will be maximum	10
iii)	Draw the phasor diagram of ideal transformer with resistive, inductive and capacitive load. Explain with circuit diagram the equivalent resistance, reactance and impedance of transformer referred to primary and referred to secondary side.	10
iv)	Explain the working of single-phase transformer with circuit diagram. Derive the emf equation of single-phase transformer. A 25 KVA, 4000/200V, 50Hz transformer has $R_1=3.45\Omega$, $R_2=.009\Omega$, $X_1=5.2\Omega$, $X_2=.051\Omega$. Calculate equivalent resistance and equivalent reactance referred to (i) Primary (ii) Secondary. Also calculate net power loss due to winding resistance.	10
v)	Explain the features of core type and shell type transformer with neat diagram.	10
vi)	Derive the condition of maximum efficiency in a single phase transformer. Explain in detail the variable losses and constant losses in single phase transformer.	10
Unit V (Short questions) – 2 marks each		
i)	Write and explain EMF equation of DC machine.	2
ii)	Write the equation of terminal voltage in DC motor and generator.	2
iii)	Explain Electro-Mechanical energy conversion in brief.	2
iv)	Give applications of dc shunt motor.	2
v)	Give principle of operation of dc generator.	2
vi)	Give principle of operation of dc motor.	2
Unit V (Long questions) – 10 marks each		
i)	An 8 pole dc shunt generator with 778 wave connected armature conductors and running at 500 rpm, supply a load of 12.5 ohm resistance at terminal voltage of 250 volts, the armature resistance is 0.24ohm and field resistance is 250ohms. Find the armature current, the induced emf and flux per pole.	10

ii)	A 4-pole shunt generator with lap connected armature has field and armature resistance of 50 ohm and 0.1 ohm respectively. It supplies power to sixty 100V, 40W lamps calculate the armature current and generated emf. Allow a contact drop of 1V per brush.	10
iii)	Explain the types of d.c. generator with the circuit diagram and equations for voltage and current.	10
iv)	Draw a neat, labelled diagram to show the essential constructional features of a d.c machine. Also describe these parts giving function of each of them.	10
v)	Draw torque-current, speed torque and speed-current characteristics of dc series, shunt and compound motor.	10
vi)	Derive the emf equation of DC machine. Also derive the relation between speed and armature current for dc series and shunt motor.	10



तीर्थकर महावीर विश्वविद्यालय
Teerthanker Mahaveer University
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End Semester Marks B.Tech.(CSE) Regular (2024-2028)

S.No.	Univ. Roll No.	Name	Max Marks (60)
1	TCA2409004	ABHAY RAJ SINGH	30
2	TCA2409008	ABHISHEK KUMAR	25
3	TCA2409026	ANAMTA NAQVI	40
4	TCA2409029	ANIMESH JAIN	32
5	TCA2409032	ANKIT KUMAR	52
6	TCA2409042	ANURAG YADAV	36
7	TCA2409045	ARCHANA KUMARI	48
8	TCA2409048	ARPIT JAIN	45
9	TCA2409055	ATUL KUMAR GUPTA	35
10	TCA2409058	AYUSH SINGH	50
11	TCA2409061	DAKSH RUHELA	45
12	TCA2409073	HARSH JAIN	47
13	TCA2409075	HARSHIT JAIN	50
14	TCA2409076	HARSHIT JAIN	35
15	TCA2409081	HRITHIK PAWAR	32
16	TCA2409084	JAY RAM KUMAR MANDAL	28
17	TCA2409086	KAMAL	34
18	TCA2409087	KARTIK KUMAR SINGH	32
19	TCA2409089	KRATI JAIN	36
20	TCA2409092	LAKSHYA GAHLOUT	37
21	TCA2409100	MANYUPMA KUMARI	38
22	TCA2409106	MOHAMMAD AMAAN	46
23	TCA2409111	MOHD AYAN	29
24	TCA2409116	NIKSHAY JAIN	23
25	TCA2409119	OMPRAKASH	25
26	TCA2409122	PANKAJ KUMAR	34
27	TCA2409124	PARTH JAIN	35
28	TCA2409127	PRAJJAWAL SINGH	24
29	TCA2409128	PRAPHOOL KUMAR	47
30	TCA2409131	PRINCE KUMAR PATEL	30
31	TCA2409135	PUNEET CHAUHAN	27
32	TCA2409139	RANJEET KUMAR	30
33	TCA2409155	SEHWAG GOUR	35

34	TCA2409166	SNEHA JAIN	25
35	TCA2409167	SONU KUMAR	20
36	TCA2409171	TANISH CHAUHAN	31
37	TCA2409172	TANZILA BASIR	55
38	TCA2409176	UTKARSH CHAUHAN	31
39	TCA2409185	VINAYAK AGRAHARI	32
40	TCA2409187	VISHVAMOHAN SHARMA	28
41	TCA2409005	ABHIMANYU RAI	25
42	TCA2409006	ABHINAV SUNIL PATIL	31
43	TCA2409010	ABHISHEK SHUKLA	41
44	TCA2409013	ADI JAIN	40
45	TCA2409020	AKSHITA JAIN	52
46	TCA2409021	AMAAN SHAHID	32
47	TCA2409022	AMAN THAPAN	40
48	TCA2409025	AMRUTA VILAS HUDDAR	34
49	TCA2409030	ANIMESH JAIN	35
50	TCA2409033	ANKIT KUMAR	50
51	TCA2409034	ANKIT KUMAR	45
52	TCA2409038	ANSH JAIN	41
53	TCA2409039	ANSHIK KUMAR GUPTA	45
54	TCA2409049	ARUN	35
55	TCA2409050	ARUN KUMAR	32
56	TCA2409053	ASHUTOSH KUMAR RAI	28
57	TCA2409056	AVADHESH KUMAR SHARMA	34
58	TCA2409064	DIVYANSH BHARDWAJ	32
59	TCA2409067	GAGANDEEP SHARMA	36
60	TCA2409072	GYAYAK PATODI	37
61	TCA2409078	HIMANSHU JAIN	38
62	TCA2409095	MAHAK JAIN	46
63	TCA2409096	MANAS MADHAV	34
64	TCA2409097	MANISEN GUPTA	45
65	TCA2409105	MISHIKA JAIN	50
66	TCA2409114	NAVED ALAM	34
67	TCA2409115	NIKET JAIN	35
68	TCA2409129	PRATEEK JAIN	45
69	TCA2409130	PRINCE JAIN	47
70	TCA2409138	RADHIKA VERMA	30
71	TCA2409143	RIDDHI JAIN	45
72	TCA2409148	SAMEER	35
73	TCA2409149	SAMYAK JAIN	45
74	TCA2409150	SANSKAR PATIL	31
75	TCA2409158	SHALABH CHAUDHARY	32
76	TCA2409159	SHASHANK KUMAR MISHRA	40
77	TCA2409160	SHEETAL	50
78	TCA2409162	SHIVANG YADAV	31
79	TCA2409175	URJA JAIN	32
80	TCA2409182	VANSH KUMAR	28

81	TCA2409193	ZAINAB AYYOOB	32
82	TCA2409001	ABDUL MUNEEB KHAN	35
83	TCA2409002	ABDUS SUBOOR KHAN	31
84	TCA2409007	ABHISHEK JAIN	35
85	TCA2409016	AJAY KUMAR	34
86	TCA2409027	ANAND MISHRA	30
87	TCA2409028	ANAND RAJ	28
88	TCA2409037	ANSH CHAUDHARY	40
89	TCA2409041	ANUJ PAL	26
90	TCA2409044	ANVI JAIN	35
91	TCA2409047	ARPAN KUMAR	40
92	TCA2409052	ASHUTOSH KUMAR	35
93	TCA2409059	AZHAAN MOHAMMAD KHAN	25
94	TCA2409060	DAKSH JAIN	29
95	TCA2409066	DIVYANSHU KUMAR	35
96	TCA2409077	HEMANT CHAHAL	32
97	TCA2409083	JAMSHED ALAM	30
98	TCA2409091	KRISH PAL	28
99	TCA2409099	MANYA JAIN	32
100	TCA2409107	MOHAMMAD FAIZ	36
101	TCA2409109	MOHAMMAD HANZALA GAZI	30
102	TCA2409112	MUSKAN	38
103	TCA2409113	NAMAN JAIN	46
104	TCA2409120	PALAK JAIN	40
105	TCA2409121	PALAK SHARMA	50
106	TCA2409125	PARTH SHARMA	35
107	TCA2409132	PRITAN KUMAR	34
108	TCA2409137	RADHIKA	52
109	TCA2409146	ROCKEY RAJ	53
110	TCA2409152	SATYAM JAIN	47
111	TCA2409156	SHAFIA KHATOON	45
112	TCA2409161	SHIMPU	42
113	TCA2409164	SHREYA PANDEY	35
114	TCA2409169	SRISTI RANI	45
115	TCA2409177	UTKARSH GUPTA	31
116	TCA2409179	VANDANA KUMARI	32
117	TCA2409181	VANSH JAIN	40
118	TCA2409183	VARSHA	50
119	TCA2409189	VISHWAS RASTOGI	40
120	TCA2409190	VIVEK YADAV	32

CO/PO Attainment Sheet

	CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
EEE117.CO1	Understanding the basics of Network, AC Waveform and its characteristics.	3	1			1							2	1		
EEE117.CO2	Understanding the basic concept of Measuring Instruments, Transformers & three phase Power systems.	3	1	1	1	2							2	1		
EEE117.CO3	Understanding the basic concepts of Transformer.	3	1	1									1			

EEE117.CO4	Understanding the basic concept of power measurement using two wattmeter methods.	3	2		2	2							1	1		
EEE117.CO5	Applying the concept of Kirchhoff's laws and Network Theorems to analyze complex electrical circuits.	3	3	2	2	2							2	2	1	
	Average	3	1.6	1.33	1.7	1.8							1.6	1.25	1	
	Attainment	1.56	0.83	0.7	0.87								0.83	0.27	0.17	



FACULTY OF ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Year: I Sem: II Branch: CSE Section: A & B

Basic Electrical Engineering (EEE117)

A.Y.: 2024-25 ODD SEM

COURSE FILE CLOSURE REPORT

Course file consists of the following details:

- ✓ Vision & Mission of Institute
- ✓ Vision & Mission of Department
- ✓ Program Educational Objectives (PEOs)
- ✓ Program Outcomes (POs)
- ✓ Program Specific Outcomes (PSOs)
- ✓ Institute Academic Calendar
- ✓ Course Evaluation Scheme
- ✓ Course Outcomes
- ✓ CO-PO-PSO Mapping
- ✓ Lecture Plan & Course Coverage
- ✓ Time Table-Faculty
- ✓ Time Table- Sections
- ✓ List of Assignments/Quizzes
- ✓ Class Test Paper (CT1, CT2, and CT3)
- ✓ Class Test Marks (CT1, CT2, and CT3)

- ✓ Class Test Solution
- ✓ Assignments/Quizzes Solution
- ✓ List of Slow Learner Students of Class test and action taken
- ✓ Previous Year Question Papers
- ✓ **End Semester Exam Analysis**
- ✓ Direct and Indirect CO Attainment- CTs & End Sem

Faculty- Dr. Shubhendra Pratap Singh

Verified by IQAC

HOD