R25 Regulation *Subject code:5ES1AK*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech I Semester Regular Examinations, January 2026

INTRODUCTION TO ELECTRICAL ENGINEERING

(ECE)

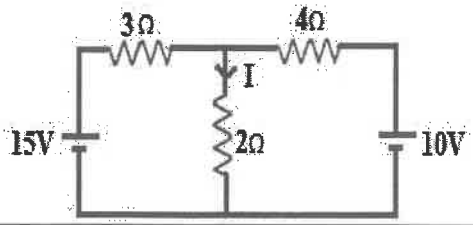
Maximum Marks: 60 Date: 23.01.2026 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (5X2M=10Marks)		Marks	CO	BTL
1.a	State Kirchhoff's Voltage Law (KVL).	2M	1	1
b	Define power factor in AC circuits.	2M	2	1
c	List any two losses in a transformer.	2M	3	1
d	What is the function of a commutator in a DC machine?	2M	4	1
e	Define earthing in electrical installations.	2M	5	1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) State and explain Thevenin's theorem. b) State Superposition Theorem. Find the current through 2Ω resistor using Superposition theorem for the circuit shown below. 	5M 5M	1	2 2
	OR			
3	a) What are the types of energy sources? Explain with symbols. b) State and explain Norton's theorem.	5M 5M	1	2 3
4	a) Derive the RMS value and average value of an AC quantity. b) Explain phasor representation of sinusoidal quantities.	5M 5M	2	4
	OR			
5	a) Explain star connection in three-phase systems. b) Write voltage relations in delta connection.	5M 5M	2	2 2

6	a) Explain the principle of operation of a transformer. b) List different transformer losses.	5M 5M	3	3 2
	OR			
7	a) A 200KVA, 3300/240V, 50Hz single phase transformer has 80 turns on the secondary winding. Assuming an ideal transformer, calculate i) the maximum value of flux ii) the number of primary turns. b) Write advantages of an auto-transformer.	5M 5M	3	2 2
8	a) Explain the working principle of a DC generator. b) Derive the back EMF equation in DC motor.	5M 5M	4	2 3
	OR			
9	a) Explain the principle and operation of three phase induction motor. b) List applications of synchronous generator.	5M 5M	4	2 2
10	a) Explain the function of MCB and ELCB. b) Explain different types of wires and cables.	5M 5M	5	2 2
	OR			
11	a) List methods of power factor improvement. b) Explain lead-acid battery with neat sketch.	5M 5M	5	2 2