R22 Regulation *Subject code: 4E2AP*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech II Semester Regular/Supplementary Examinations, July 2025

BASIC ELECTRICAL ENGINEERING

(Common to CSE & CSE(AI&ML))

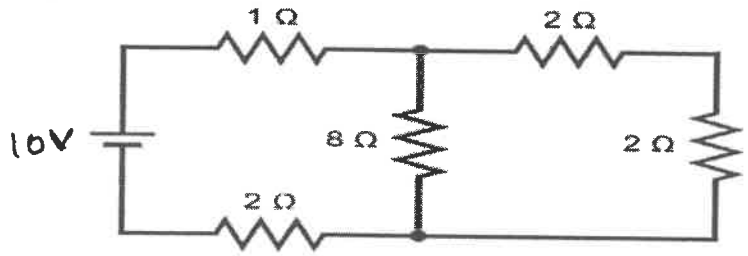
Maximum Marks: 60 Date:15.07.2025 Duration: 3 hours

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 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 (10X1M=10 Marks)		Marks	CO	BTL
1.a	What is meant by independent source?	1M	1	L1
b	State Thevenin's theorem?	1M	2	L1
c	Define Peak factor of a sine wave.	1M	1	L1
d	Define real power.	1M	1	L1
e	Write about regulation of a transformer.	1M	3	L2
f	What is the purpose of laminating the core in a transformer?	1M	3	L2
g	What the significance of back EMF in dc motor?	1M	3	L4
h	What is the principle of DC motor?	1M	3	L1
i	Write the importance of energy meter.	1M	4	L2
j	What is the purpose of earthing?	1M	4	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) Explain KCL and KVL? b) Find the total current flowing through Circuit if the source voltage connected is 10 V? 	5M 5M	1 1	L2 L3
	OR			
3	a) State and explain Superposition theorem. b) Distinguish Nodal and Mesh analysis.	5M 5M	2 1	L2 L3
4	a) Derive the equation for RMS value of voltage of a sine wave.	5M	1	L3

	b) A 20 Ω resistance and 30mH inductance are connected in series and the circuit is fed from a 230V, 50Hz, AC supply. Find i) Impedance ii) Current. iii) Voltage across the resistance iv) Voltage across the inductance v) Power Factor	5M	1	L3
	OR			
5	a) Derive an expression for the current in RL Series circuit with sinusoidal input. b) Derive the relation between phase and line values in a balanced star connected three phase system.	5M 5M	1 1	L3 L3
6	a) Explain the working principle of single-phase Transformer. b) Derive the EMF Equation for a single-phase Transformer.	5M 5M	3 3	L2 L3
	OR			
7	a) Explain the No-load condition of single-phase Transformer with neat diagram. b) Explain OC test on single phase transformer.	5M 5M	3 3	L2 L2
8	a) Explain the Principle of operation of DC Generator. b) An 8-pole d.c. generator has 500 armature conductors, and a useful flux of 0.05 Wb per pole. What will be the e.m.f. generated if it is wave-connected and runs at 1200 rpm.	5M 5M	3 3	L2 L3
	OR			
9	a) Derive the torque equation for a DC Motor. b) How the rotating magnetic field generated in three phase induction motor?	5M 5M	3 3	L2 L4
10	a) Explain construction and working of MCB. b) Explain the characteristics of batteries.	5M 5M	4 4	L2 L2
	OR			
11	a) Explain the concept of power factor improvement. b) Compare primary battery and secondary battery.	5M 5M	4 4	L2 L3