R22 Regulation *Subject code: 4E1AI*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Regular/Supplementary Examinations, January 2024

FUNDAMENTALS OF ELECTRICAL ENGINEERING

(ELECTRONICS & COMMUNICATION ENGINEERING)

Maximum Marks: 60 Date:20.01.2024 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 (10x1M=10 Marks)	**CO No.**	Bloom Tx
1.	a	State the steps in Nodal analysis.	CO1	BL1
	b	What are the types of dependent sources.	CO1	BL1
	c	Draw the response of Series RC circuit for step input.	CO1	BL2
	d	Define RMS value.	CO1	BL1
	e	Write the principle of Transformer.	CO2	BL1
	f	What is the difference between Electric circuit and Magnetic circuit.	CO2	BL2
	g	What are the types of Armature windings in DC Machine.	CO3	BL2
	h	State the Principle of DC Motor.	CO3	BL1
	i	What is MCCB.	CO4	BL1
	j	State the function of SFU.	CO4	BL1

Part-B

		Answer All the following questions. **(5X10M=50Marks)**		
2		A. State and explain Krichoff's laws with an example. [5M]	CO1	BL2
		B. Find Io using mesh analysis for circuit shown below. [5M]	CO1	BL4

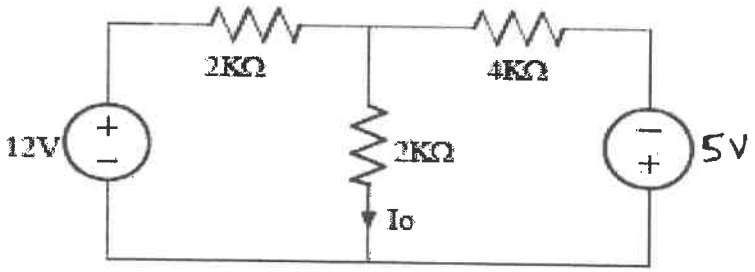

Fig. 1

	OR		
3	A. Explain Star-Delta Transformations and derive expressions for equivalent resistances. [7M] B. State Superposition theorem. [3M]	CO1 CO1	BL3 BL2
4	A. Analyze Series RL Circuit for any standard input and derive the expressions for voltage and current. [5M] B. Illustrate Rectangular and polar representation of phasors. [5M]	CO1 CO1	BL3 BL2
	OR		
5	A series RLC circuit consists of a resistance of 1KΩ and an inductance of 100mH in series with capacitance of 10pF. If 100 V, 50 Hz voltage is applied as input across the combination determine total current and voltage across each element in the circuit. [10M]	CO1	BL4
6	A. Explain the principle of working of single-phase transformer on no load conditions. [5M] B. Draw and explain the Equivalent Circuit of a Transformer on no-load. [5M]	CO2 CO2	BL3 BL3
	OR		
7	Illustrate the conduction of OC test on 1-phase Transformer with its circuit. [10M]	CO2	BL4
8	Explain the Construction and working principle of DC machines with its diagram. [10M]	CO3	BL3
	OR		
9	Derive an expression for torque developed in a DC motor. [10M]	CO3	BL4
10	A. Explain the Basic concept of wiring systems. [5M] B. Illustrate power factor improvement methods. [5M]	CO4 CO4	BL2 BL3
	OR		
11	A. Explain types of Batteries. [5M] B. Describe the concept of Earthing. [5M]	CO4 CO4	BL3 BL3