R22 Regulation *Subject code:4E1AE*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Supplementary Examinations, June 2026

ELECRICAL CIRCUITS

(EEE)

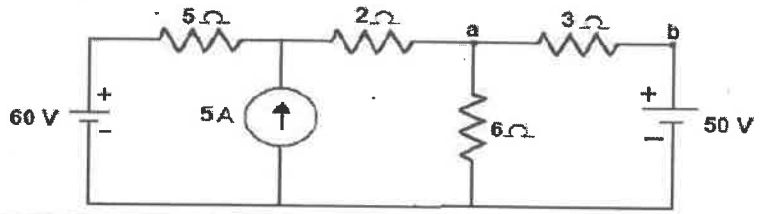
Maximum Marks: 60 Date: 20.06.2026 Duration: 3 hours

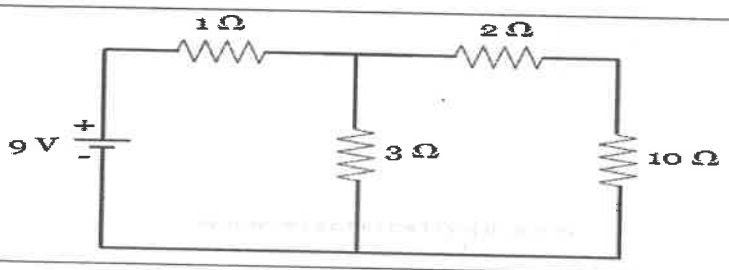
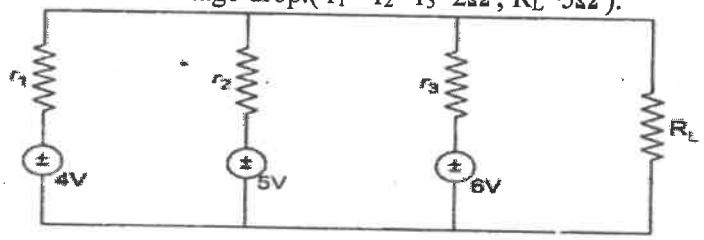
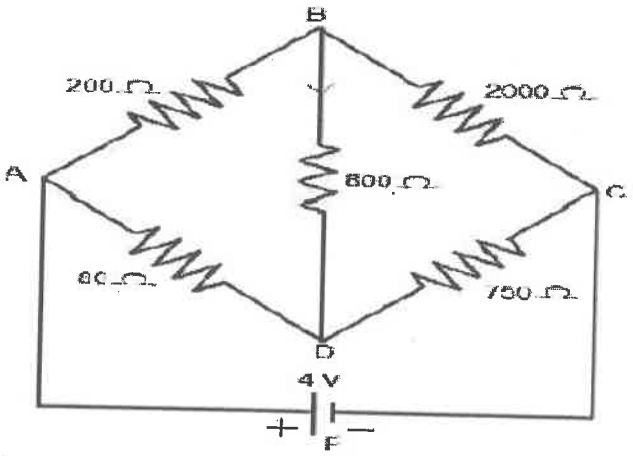
Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	BTL
1.a	What are Unilateral and Bilateral elements?	1M	1	L1
b	Write the difference between a circuit and a network.	1M	1	L1
c	Define RMS.	1M	2	L1
d	Define alternating current.	1M	2	L1
e	Write the statement of thevenin's theorem.	1M	3	L1
f	Write the statement of Norton's theorem.	1M	3	L1
g	What is the phase sequence of the 3-phase system.	1M	4	L1
h	What is complex power?	1M	4	L1
i	Define self-Inductance.	1M	5	L1
j	Define connected and unconnected graph?	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	Derive the voltage,current,power and energy equations for Resistor,Inductor and Capacitor.	10M	1	L2
	OR			
3	Find the current through branch a-b using mesh analysis shown in figure below. 	10M	1	L2
4	Explain about alternating current through RL series circuit. And also derive the power and power triangle.	10M	2	L2
	OR			
5	Explain briefly about series and parallel Resonance.	10M	2	L2
6	For the given circuit, determine the current through 10 Ω resistor using Norton's theorem.	10M	3	L2

				
	OR			
7	Using Milliman's theorem calculate the current throught R_L in the circuit, andfind the voltage drop.($r_1 = r_2 = r_3 = 2\Omega$, $R_L = 5\Omega$). 	10M	3	L2
8	A three phase balanced delta connected load of (10+j8) ohm is connected across a 400V, 3-ϕ balanced supply. Determine the phase currents and line currents. Assume phase sequence to be RYB.Also calculate the power drawn by the load.	10M	4	L2
	OR			
9	Derive the relation between the line and phase quantities in star and delta connection system for a balanced star and delta connected load.	10M	4	L2
10	Explain the concept of self and mutual inductance.	10M	5	L2
	OR			
11	Derive cutset matrix for the given circuit 	10M	5	L2