R20 Regulation *Subject code: 3P3BB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, June 2026

ELECTRICAL CIRCUIT ANALYSIS

(EEE)

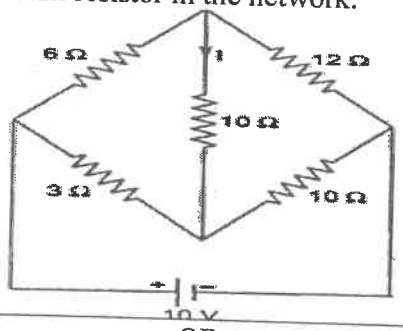
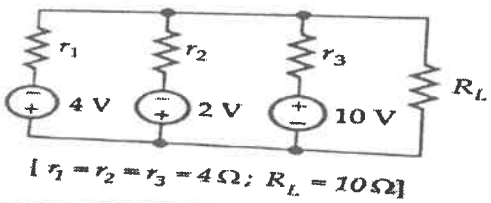
Maximum Marks: 70 Date: 11.06.2026 Duration: 3 hours

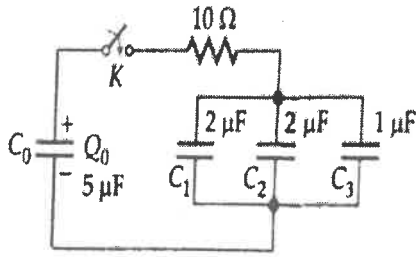
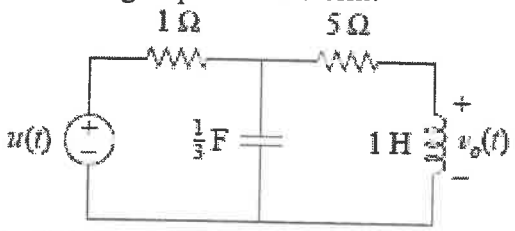
Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X2M=20 Marks)		Marks	CO	BTL
1	Write the statement of Superposition Theorem	2M	1	L1
2	Write the statement of compensation Theorem	2M	1	L1
3	What is the main reason for the transients to occur in a circuit?	2M	2	L1
4	Define Tree and Co-tree.	2M	2	L1
5	Define Quality Factor.	2M	3	L1
6	What is the main reason for the transients to occur in a circuit?	2M	3	L1
7	Write the transient conditions for the inductor and capacitor.	2M	4	L1
8	Define convolution integral	2M	4	L1
9	Derive the condition for symmetry for h parameters	2M	5	L1
10	Draw the equivalent circuit y parameters in two port networks	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Write the statement of Thevenin's theorem and Using Thevenin's theorem find the current I in 10 ohm resistor in the network. 	10M	1	L2
	OR			
12	Using Millman's theorem, find the current through R_L in the circuit.  [$r_1 = r_2 = r_3 = 4\Omega$; $R_L = 10\Omega$]	10M	1	L2

13	a) Write the transient free condition for series RL circuit with AC excitation. b) A 5μF capacitor is initially charged with 500μC. At t=0, the switch K is closed. Determine the voltage drop across the resistor at t=0 and t=∞.  	5M 5M	2	L2
	OR			
14	a) When does transients occur in a circuit? Explain. b) Derive the Transient state response for Current in first order RL series circuit.	5M 5M	2	L2
15	For the RLC series circuit R=5ohms, L=0.03H, C=100 micro farads. Determine the Frequency at which the circuit resonates. Also find the quality factor, voltageacross the inductance, voltage across capacitance, at resonance	10M	3	L2
	OR			
16	a) Derive the Quality factor for series RL circuit? b) Derive the resonance condition for series and parallel RLC circuits with neat waveform.	5M 5M	3	L2
17	Find $v_o(t)$ in the circuit using Laplace transform.  	10M	4	L2
	OR			
18	a) Find the inverse Laplace transform of F(S) $=\frac{3}{S}-\frac{5}{S+1}+\frac{6}{S+4}$ b) Find the transient response of RL series circuit with DC excitation when switch is closed at t=0 using Laplace transform.	5M 5M	4	L2
19	Derive the condition of Reciprocity and symmetry for a two port Y-parameter.	10M	5	L2
	OR			
20	Derive the condition of Reciprocity and symmetry for a two port transmission and h parameters.	10M	5	L2