R20 Regulation *Subject code: 3P3BB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

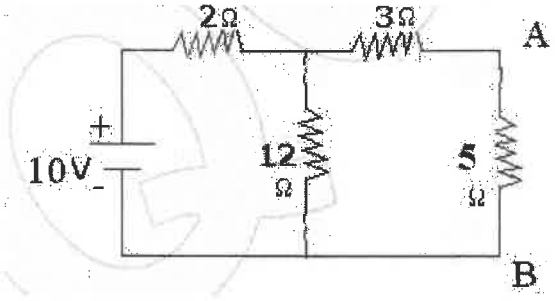
B.Tech III Semester Supplementary Examinations, July 2024

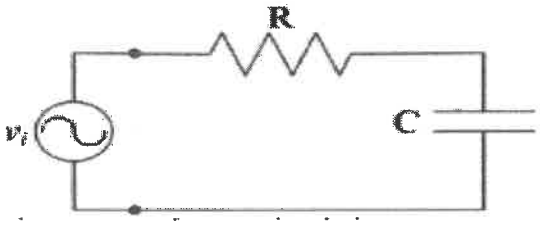
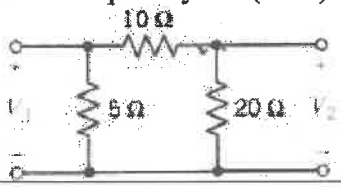
ELECTRICAL CIRCUIT ANALYSIS

(EEE)

Maximum Marks: 70 Date:20.07.2024 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 which carries 10M.
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)		CO	Bloom Tx
1	State Thevenin's Theorem?	1	L2
2	Define Tree and Co-tree?	1	L1
3	What is the main reason for the transients to occur in a circuit?	2	L1
4	Explain transient conditions for the inductor and capacitor?	2	L1
5	Define Bandwidth and selectivity?	3	L1
6	Define the term form factor, peak factor and Time period?	3	L2
7	Give the Laplace transform for the signal step, ramp, Impulse and sine inputs?	4	L1
8	What is pole-zero plot?what is its significance	4	L1
9	Explain the symmetry condition for ABCD and Y parameters	5	L1
10	Draw the Equivalent circuit of Y-Parameter and write the equations?	5	L2
	Part-B		
Answer All the following questions. (5X10M=50Marks)			
11	Explain Basic incidence matrix and Basic cut set matrix with an example? (10M)	1	L2
	OR		
12	Write the statement of Norton's theorem (10M) Draw the Norton's equivalent circuit and find the current through 5ohm resistance across the terminal A-B of the circuit shown below. 	1	L3

13	a) Derive the Transient state response for Current in first order RL series circuit. (5M) b) Define: (5M) (i)Order of circuit? (ii)Forced Response & Natural Response? (iii)Time constant for series RL and RC circuits	2	L3
	OR		
14	a) Derive the expression for Current i(t) for a parallel RL Circuit (5M) b) Derive the expression for Current i(t) for a Series RC Circuit (5M)	2	L3
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	L3
	OR		
16	Derive the resonance condition for series and parallel RLC circuits with neat waveform. (10M)	3	L3
17	Analyse the series RL circuit using laplace transform when a unit step input is applied. (10M)	4	L2
	OR		
18	a) Find the initial and final value of the function whose Laplace transform is $H(S)=20/(S+3)(S^2+8S+25)$ (5M) b) Using Laplace Transform find the current i(t) in the below circuit. (5M) 	4	L2
19	Derive the condition of Reciprocity and symmetry for a two port transmission. (10M)	5	L3
	OR		
20	In the given network as shown in Fig. Find Z – parameters and check the conditions for symmetry and Reciprocity. X (10M) 	5	L3