



R20 Regulation **Subject code: 3P3BB**
TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech III Semester Supplementary Examinations, February 2024
ELECTRICAL CIRCUIT ANALYSIS

(EEE)

Maximum Marks: 70

Date: 19.02.2024 Duration: 3 hours

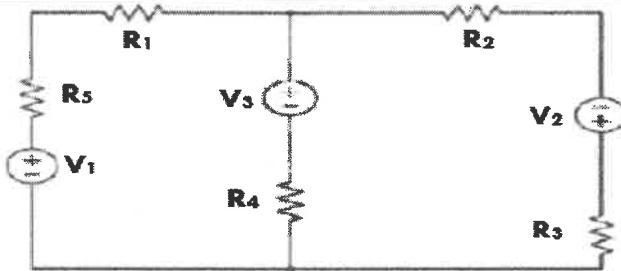
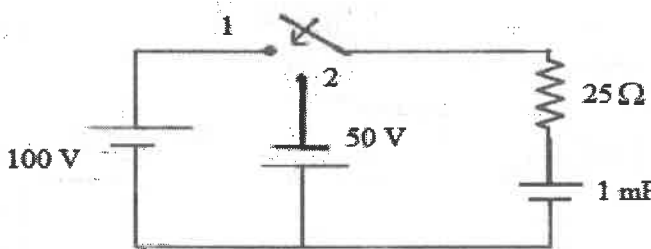
- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

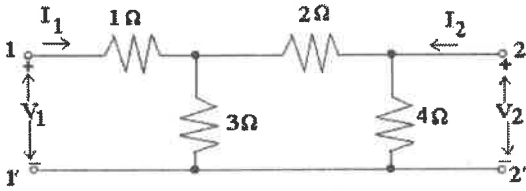
Part-A

All the following questions carry equal marks (10X2M=20 Marks)		CO	Bloom Tx
1	How is Thevenin's theorem related to Norton's theorem?	CO1	L2
2	Write the duality of R,L,C Elements.	CO1	L2
3	A dc voltage of 20V is applied in a RL circuit where $R=5\ \Omega$ and $L=10H$. Find time constant.	CO2	L2
4	Why the current in a pure inductance cannot change in zero time.	CO2	L2
5	List out few Advantages of 3-phase system over single-phase system.	CO3	L2
6	What is the phase relationship between voltage and current in a series resonant circuit at resonance?	CO3	L2
7	How do you transform a time-domain circuit into the Laplace domain?	CO4	L2
8	Write the necessary conditions for transfer function.	CO4	L2
9	List out few real time Applications of Hybrid parameters.	CO5	L2
10	Write reciprocal condition for Z-parameters?	CO5	L2

Part-B

Answer All the following questions. (5X10M=50Marks)				
11	Explain about Maximum power transfer theorem with suitable example.	10M	CO1	L2
	OR			
12	Apply Superposition theorem to calculate current flowing through $R_4 = 10\ \Omega$ resistor as shown in Fig. ($R_1=8\ \Omega$, $R_2=5\ \Omega$, $R_3=9\ \Omega$, $R_4 = 10\ \Omega$, $R_5 = 2\ \Omega$) ($V_1=100V$, $V_2=20V$, $V_3=30V$)	10M	CO1	L3

	 Fig.			
13	In the circuit shown in Fig., the switch is put in position-1 for 1 msec and then thrown to position-2. Find the transient current in both intervals.  Fig.	10M	CO2	L3
OR				
14	Derive the expression for transient response of R-L-C series circuit with unit step input with required diagrams.	10M	CO2	L3
15	A Capacitor C is connected in series with a 40 Ω resistor across a supply of frequency 50 Hz. A current of 3A flows and the circuit impedance is 50 Ω. Calculate (a) the value of the Capacitance, C, (b) the supply voltage (c) the phase angle between the supply voltage and current (d) the potential drop across the resistor, and (e) Draw the phasor diagram.	10M	CO3	L3
OR				
16	(a) Derive the effective value in the context of a sine waveform. (b) Write a short note on Ideal Transformer.	6M 4M	CO3	L3
17	Find $f(t)=L^{-1} [F_1(s).F_2(s)]$ by using convolution theorem for the functions. i) $F_1(S)=\frac{1}{s^2}$, $F_2(S)=\frac{1}{s+2}$ ii) $F_1(S)=\frac{1}{s(s+1)}$, $F_2(S)=\frac{1}{s^2+1}$	10M	CO4	L2

	OR			
18	Find the inverse Laplace transform of the function $F(s) = (3s + 2)/(s^2 + 4s + 5)$.	10M	CO4	L2
19	Calculate the transmission parameters of the network shown below Fig. Also verify the Reciprocity & symmetry of the network.	10M	CO5	L4
 Fig.				
	OR			
20	Derive the relation between Z and Y parameters.	10M	CO5	L4

