Question Paper Code: R22A11EE01

R22

ANURAG Engineering College

(An Autonomous Institution)

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

ELECTRICAL CIRCUIT ANALYSIS - I

(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 Hours **Max. Marks: 60**

Section – A (Short Answer type questions) (10 X 1M = 10M)

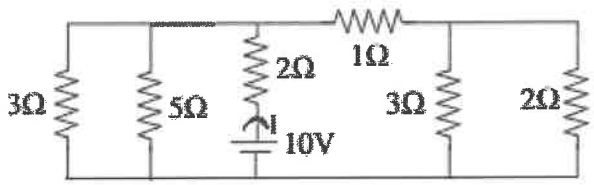
Answer All Questions

		Course Outcome	B.T Level	Marks
1.	What is value of resistance in Open circuit & Short circuit?	CO1	L1	1M
2.	Give the statements of Kirchhoff's voltage and current law.	CO1	L1	1M
3.	What is the value of phase angle between voltage and current in pure capacitor?	CO2	L1	1M
4.	Write the formula for series resonance frequency.	CO2	L1	1M
5.	Write the statement of Reciprocity theorem in DC circuit.	CO3	L1	1M
6.	What is the condition to be satisfied in order to transfer maximum power from source to load?	CO3	L1	1M
7.	Write the formula for Active and Reactive power in 3-phase circuit.	CO4	L1	1M
8.	Write 3 phase power equation?	CO4	L1	1M
9.	Define self and mutual inductance.	CO5	L1	1M
10.	What is the advantage of Network topology?	CO5	L1	1M

Section B (Essay Questions)

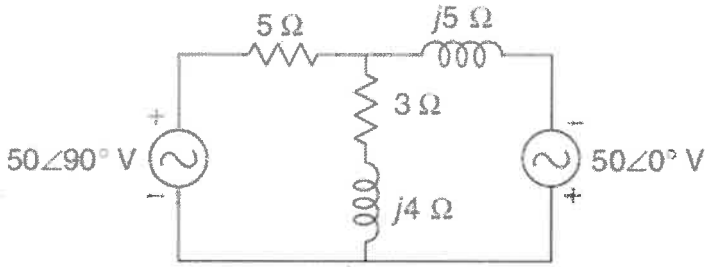
Answer all questions, each question carries equal marks. **(5 X 10M = 50M)**

11. A)	Derive the expressions for star to delta transformation.	CO1	L3	10M
	OR			
B)	Find the value of "I" in the network shown in below figure.	CO1	L3	10M



12. A)	Derive the expression for average value and RMS value of a sinusoidal wave form.	CO2	L3	10M
	OR			
B)	An RLC Series circuit consists of R=1k Ω, L=100mH, C=10μF. If a voltage of 100V is applied across the combination, determine resonant frequency, quality factor and bandwidth.	CO2	L3	10M

13. A)	State Super Position Theorem. Find the current through the 3 + j4 ohm impedance for the following fig.	CO3	L3	10M



OR

B)	State and explain Maximum Power transfer theorem for DC Excitation with an example.	CO3	L3	10M
14. A)	The two-wattmeter method is used to measure power in a three-phase load. The wattmeter readings are 400W and -35W. Calculate (i) Total active power (ii) Power factor (iii) Reactive Power.	CO4	L3	10M

OR

B)	A three-phase balanced delta connected load of $10<60^0$ Ω is connected across a 450 V, 3 phase balanced supply. Determine the phase currents and line currents. Assume RYB phase sequence.	CO4	L3	10M
15. A)	Derive the expression for coefficient of coupling between pair of magnetically coupled coils.	CO5	L3	10M

OR

B)	Find the equivalent inductance of the network shown in Fig.	CO5	L3	10M