

ANURAG Engineering College

(An Autonomous Institution)

II B.Tech I Semester Supplementary Examinations, June/July-2024

ELECTRICAL CIRCUIT ANALYSIS

(ELECTRICAL & ELECTRONICS ENGINEERING)

Time: 3 Hours

Max. Marks: 75

Section – A (Short Answer type questions)**(25 Marks)****Answer All Questions**

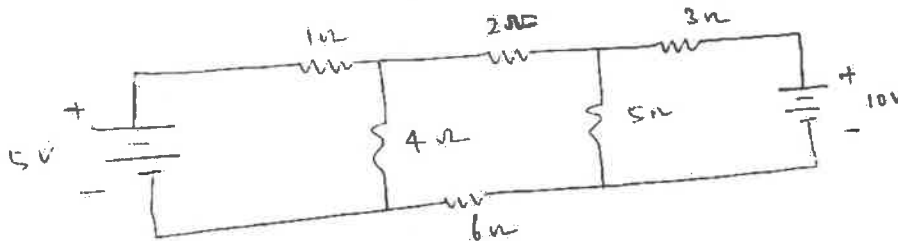
Course Outcome	B.T Level	Marks
CO1	L1	2M
CO1	L1	3M
CO2	L2	2M
CO2	L1	3M
CO3	L1	2M
CO3	L2	3M
CO4	L1	2M
CO4	L1	3M
CO5	L2	2M
CO5	L1	3M

- Define an ideal voltage source?
- State Millman's theorem?
- Sketch the transient response of RC circuit to step input voltage?
- Define the time constant of RL circuit?
- Write an expression for the bandwidth of a series resonant circuit in terms of Q factor and resonant frequency?
- What is the dynamic resistance of the parallel resonant circuit?
- Define a two-port network?
- What is a low pass filter?
- State the dual elements for Resistance and Inductance?
- What will be the readings of the two wattmeters used for measurement of power in a three-phase circuit at UPF?

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

- Find the currents in all branches of the network shown in figure by
A) Mesh method?

CO1 L3 10M

**OR**

- State and explain the Maximum power transfer theorem with an suitable example?

CO1 L3 10M

- Find the expression for transient current after the switch is closed at
A) $t=0$, assuming zero initial condition. When RL circuit, $V=20V$, $R=2$ Ohm and $L=5H$.

CO2 L3 10M

OR

- Define an expression for RC transient current after the switch is closed at $t=0$, when input is sinusoidal voltage?

CO2 L3 10M

13. Draw the locus diagram for current and find the current and power factor for maximum power. Also find the maximum power and the corresponding value of the Resistance R. When input is 500V Ac, $R = 0$ to ∞ , and $X_c = 400$ ohm? CO3 L3 10M
- OR**
- B) A RLC circuit has a resistance of 100-ohm, Inductance 0.5H and the maximum current flows through it at a frequency of 40 HZ. If the supply is 100V at 50 cps, find the current, power factor and voltage across each element? CO3 L3 10M
14. For a two-port network, Find the ABCD and Z parameters. The parameters of the network are $Y_{11} = 1$ mho, $Y_{22} = 0.5$ mho, $Y_{12} = Y_{21} = -0.2$ mho? CO4 L3 10M
- OR**
- B) Design a constant k type Band pass filter having cut off frequency $f_1 = 1$ KHZ, $f_2 = 10$ KHZ and characteristic impedance $Z_0 = 500$ ohm? CO4 L3 10M
15. Explain the following CO5 L3 10M
- A) i) Graph ii) Tree iii) Basic cut set iv) Basic tie set v) Duality
- OR**
- B) Derive the relation between line and phase quantities of a balanced three phase star connected system? CO5 L3 10M