

I B. Tech II Semester Supplementary Examinations, January/February - 2023
ELECTRICAL CIRCUIT ANALYSIS –I
 (Electrical and Electronics Engineering)

Time: 3 hours

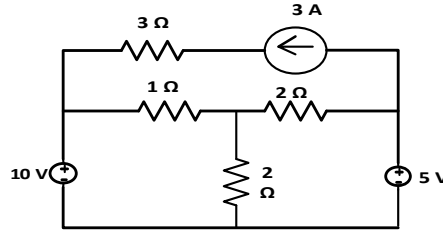
Max. Marks: 70

Answer any FIVE Questions ONE Question from Each Unit

All Questions Carry Equal Marks

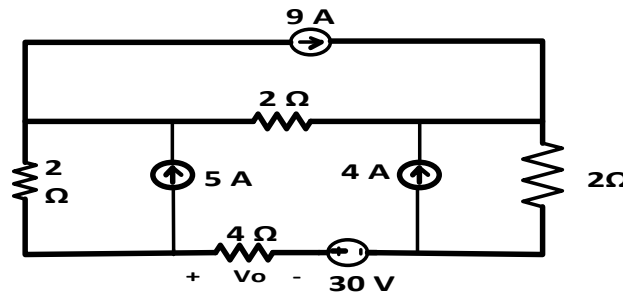
UNIT - I

1. Determine the current through $1\ \Omega$ resistance using mesh analysis in the given circuit below. [14M]



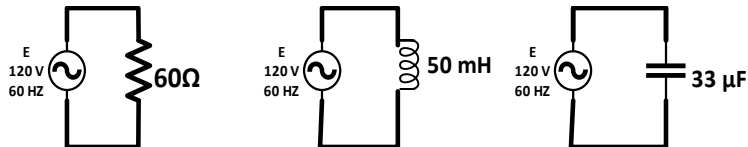
(OR)

2. Find the voltage V_O in the circuit given below. [14M]



UNIT - II

3. Calculate the power supplied when a 120V, 60 Hz source is connected as shown in figure below to a) A $60\ \Omega$ resistor b) A 50 mH inductor and c) A $33\ \mu\text{F}$ capacitor. [14M]



(OR)

4. a) An iron ring of mean length 40 cm has an air gap of 2 mm and a winding of 300 turns. If the permeability of the iron core is 300, when a current of 1A flows through the coil, find the flux density. [7M]
 b) Define Faraday's laws of electromagnetic induction. [7M]

UNIT - III

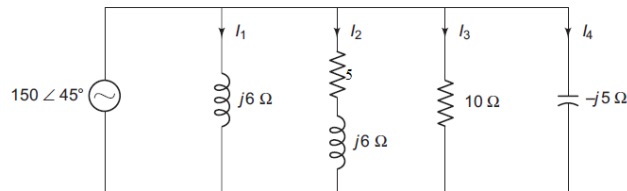
5. a) Explain the sinusoidal steady state analysis of RLC series circuit and draw the phasor diagram. [7M]



- b) In a series circuit containing a pure resistance and a pure inductance, the current and voltage are expressed as $i(t) = 5 \sin(314t + 2\pi/3)$ and $V(t) = 15 \sin(314t + 5\pi/6)$. Find the impedance of the circuit, resistance and inductance of the circuit. Also find the real power, reactive power and complex power. [7M]

(OR)

6. a) Obtain the total current and branch currents of the circuit shown in figure. [10M]



- b) Briefly explain the importance of J-factor. [4M]

UNIT - IV

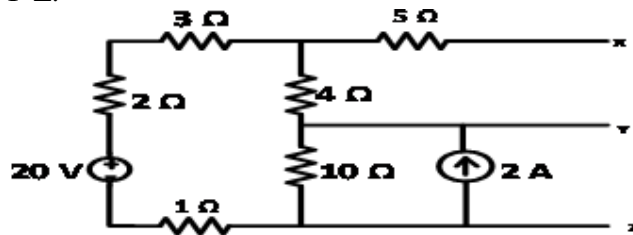
7. Explain the procedure of drawing a locus diagram for RL series circuit, with fixed L and variable R. [14M]

(OR)

8. Derive the expressions for Q-factor of a) Series R-L branch b) Parallel R-C branch. [14M]

UNIT - V

9. Determine Thevenin's and Norton's equivalent for the circuit shown below across terminals Y-Z. [14M]



(OR)

10. 2. Find current through the 10Ω resistor of the circuit shown in figure using Millmans theorem. [14M]

(10)

