

Name of the Student \_\_\_\_\_

Roll No. \_\_\_\_\_

**MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY**  
End Term Exam, Dec '2024

Course: **B. Tech**

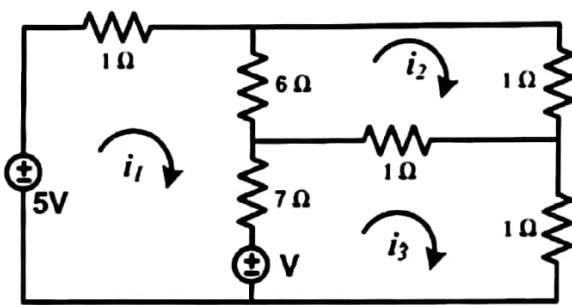
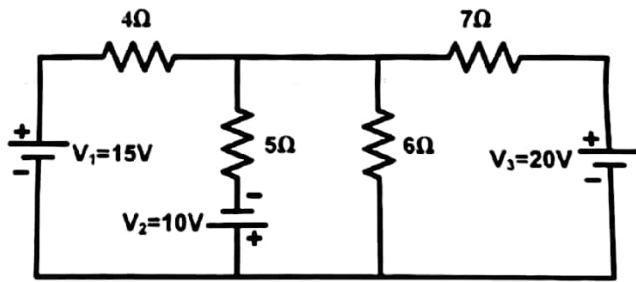
Semester - I

Branch: **SECTION- F, G, H, I, J**

Subject Name : Basic Electrical and Electronics Engineering

Subject Code: EE-108

Time : **2 Hours**Max Marks: **40****NOTE:** All questions are compulsory. Assume the necessary data suitably if any missing.

Q.No.	Question	Marks
1	<p>a) Calculate the voltage 'V' in the circuit shown in fig. 1 by Mesh method such that the current through 5V source is zero.</p>  <p align="center">Fig.1</p> <p>b) In the given network as shown in Fig. 2, find the current through the 6 Ω resistor using Superposition theorem.</p>  <p align="center">Fig. 2</p>	<p>5</p> <p>5</p>
2	<p>(a) Derive the relation between the voltage and current for an R-L-C circuit <u>using phasor diagram</u>. Also derive the average power consumed by the circuit. Define and explain the condition of Series resonance.</p> <p>(b) A voltage of 200V is applied to a series circuit consisting of a resistor, an inductor and a capacitor. The respective voltages across these components are 170V, 150V and 100V and the circuit current is 4 A. Find the power factor of the inductor and of the circuit.</p>	<p>5</p> <p>5</p>
3	<p>(a) Explain the principle of operation of a transformer at (i) no load and (ii) full load lagging power factor..Draw the phasor diagram to show all operational events from no load to full load.</p> <p>(b) A 50 kVA single-phase transformer has a full-load primary current of 250 A and total resistance referred to primary is 0.006 ohm. If the iron loss amounts to 200 W, find the efficiency on full-load and half-load at (i) unity power factor and (ii) 0.8 power factor.</p>	<p>5</p> <p>5</p>
4	<p>(a) Explain the working of FW rectifier <u>with the help of neat connection diagram and waveforms</u>. Derive the expression for rectifier efficiency &amp; ripple factor.</p> <p>(b) (i) What is the working principle of a DC motor? Explain the concept of back EMF. (ii) A six-pole lap wound DC generator has 720 conductors, and a flux of 40 mWb per pole is driven at 400 rpm. Find the generated EMF.</p>	<p>5</p> <p>2</p> <p>3</p>