H Roll No. .....

TEE–201

B. TECH. (SECOND SEMESTER)
MID SEMESTER
EXAMINATION, March, 2024
BASIC ELECTRICAL ENGINEERING

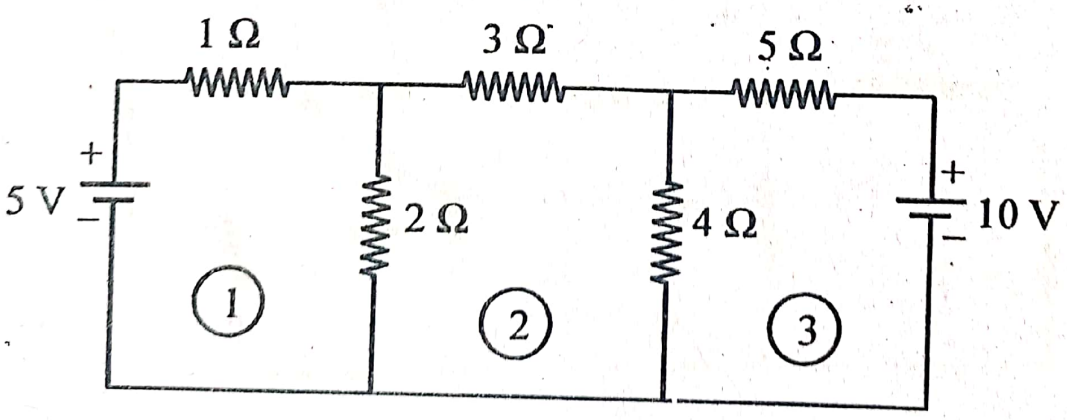
Time : 1½ Hrs.

Maximum Marks : 50

Note : (i) Answer all questions by choosing any *one* of the sub-questions.

(ii) Each sub-question carries 10 marks.

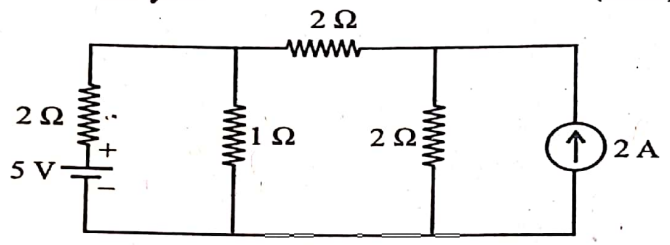
1. (a) Using mesh analysis, find the value of the currents I_1, I_2 and I_3 flowing clockwise in the first, second and third mesh respectively. (CO2)



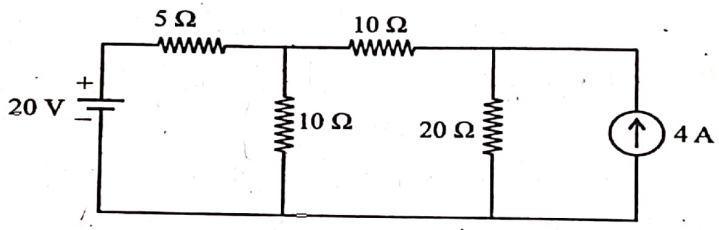
P. T. O.

OR

(b) Calculate current in 1 ohm using nodal analysis. (CO2)

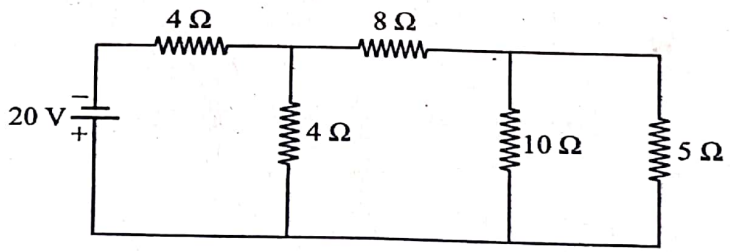


2. (a) Find the current flowing through 20 Ω using the superposition theorem. (CO2)



OR

(b) Calculate the current through the load resistance (R_L) = 5 Ω using Thevenin's theorem. (CO2)



3. (a) (i) A capacitor of C farads is charged with q Coulomb. What is the stored energy ? (CO1)

(ii) A heating element is marked 210 V, 630 V. Find the resistance of the element when connected to a 210 V d.c. source. (CO1)

OR

(b) (i) Explain Kirchhoff's law with example. (CO1)

(ii) Differentiate between the following : (CO1)

(1) Dependent and independent sources

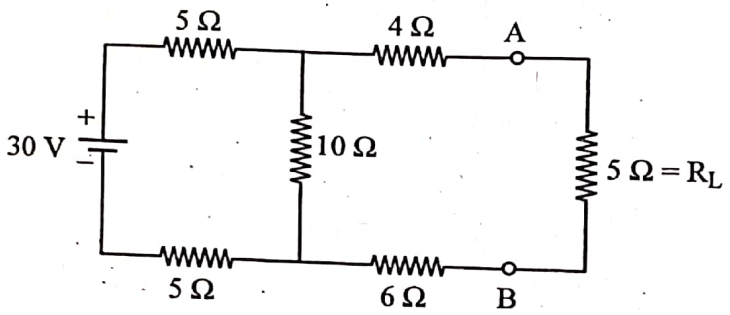
(2) Loop and Mesh

(3) Unilateral and Bilateral elements

(4) Linear and Non-linear elements

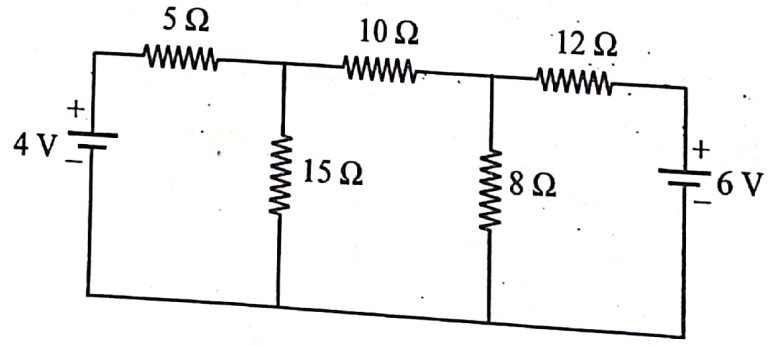
4. (a) (i) Plot a graph showing the variation of capacitive reactance with the change in the frequency of the AC source. (CO1)

(ii) In the network shown in figure, calculate the current through the load resistor R_L by using Norton's Theorem. (CO1)



OR

(b) By using Kirchhoff's voltage law (KVL)/Mesh analysis, find the current flowing through a 10 Ω resistor. (CO1)



5. (a) Define the following : (CO1)

(i) RMS and Average of AC

(ii) Instantaneous value of AC

(iii) Phase and frequency

(iv) Form factor and peak factor

OR

(b) (i) An alternating current has RMS value of 50 A and frequency 60 Hz. Find the time taken to reach 50 A for the first time. (CO1)

(ii) If the form factor of a current wave form is 2 and the peak factor is 2.5, find the average value of the current if the maximum value of the current is 500 A. (CO1)