

International Islamic University Chittagong
Department of Electrical and Electronic Engineering

B. Sc. Engineering in EEE

Midterm Examination, Autumn 2022

Course Code: **EEE 1101**

Course Title: **Electrical Circuits I**

Time: 1 hour 30 minutes

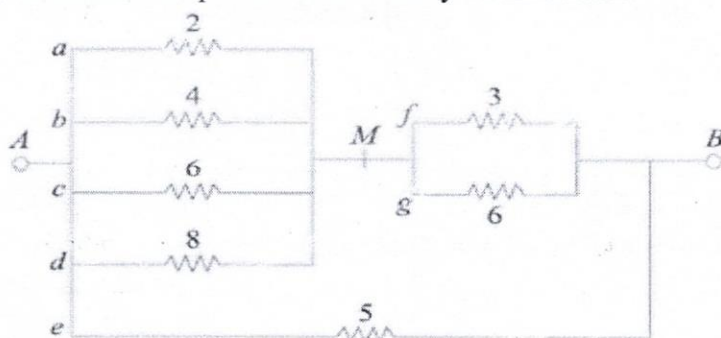
Full Marks: 30

- (i) Answer all the questions. The figures in the right-hand margin indicate full marks.
(ii) Course Outcomes (COs) and Bloom's Levels are mentioned in additional Columns.

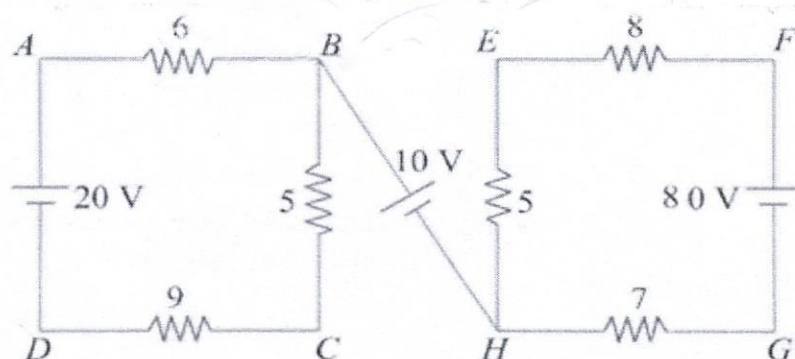
Course Outcomes (COs) of the Questions	
CO1	Reflect a basic understanding on current, voltage, energy, power, sources, and circuit element in a dc circuit, various network theorems, dc responses reactive circuit elements and magnetic circuits.
CO2	Apply circuit laws and network theorems to solve dc circuits.
CO3	Apply circuit laws to solve problems of dc response with reactive elements & ampere's circuital law for magnetic circuits.

Bloom's Levels of the Questions						
Letter Symbols	R	U	Ap	An	E	C
Meaning	Remember	Understand	Apply	Analyze	Evaluate	Create

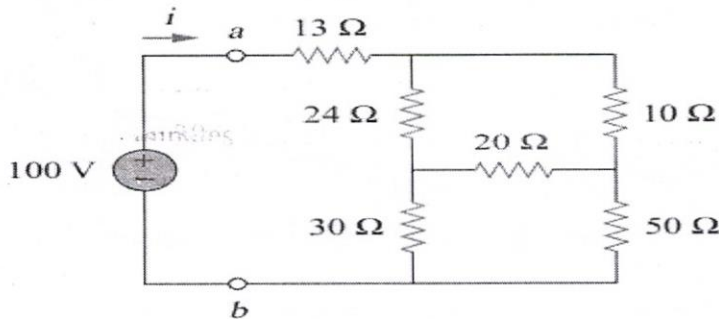
1. a) A 40 V DC voltage source (E) is connected between the terminals A-B in the network below. Determine the total power consumed in the network by two ways namely (i) power consumed by the resistor R_{AB} and (ii) summation of power consumed by each resistor. CO2 E 5



1. b) Find V_{AE} and V_{CF} in the circuit given below. CO2 E 5



- 2) a) Verify that a delta connected resistive load can be replaced by an equivalent wye-connected resistive load. (Determine the resistors of wye connected system in terms of delta connected resistors.) CO1/ An 5
CO2
- 2) b) Determine R_{ab} and i in the circuit given below. CO2 E 5



- 3) a) Apply mesh analysis to determine the direction and amount of current flows through the 4 ohm resistor for the network shown in Fig. 3(a). CO1/ Ap 2+3
CO2
- 3) b) Determine the current i_o for the circuit shown in Fig. 3(b). Apply Node voltage method to solve the problem. CO3 Ap 5

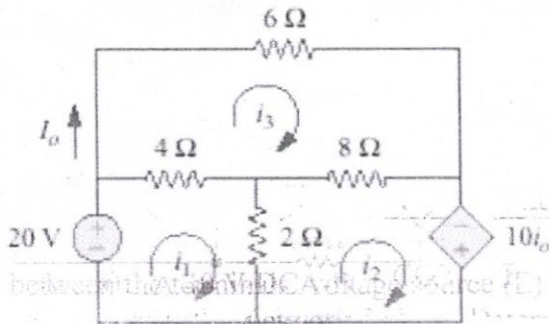


Fig. 3(a) Network for the question no 3a
(Mesh Analysis)

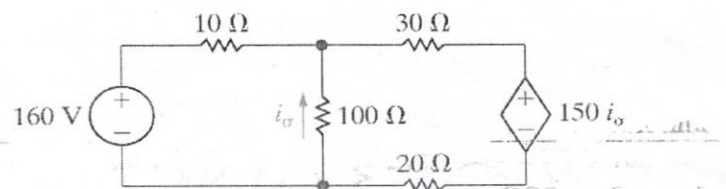


Fig. 3(b) Network for the question no 3b
(Nodal Analysis)

OR

- 3) a) Indicate loop current and determine the current flows through the 1 Ω resistor for the circuit shown in Fig. 4(a). CO1/ Ap 2+3
CO2
- 3) b) Use node voltage method to determine v_1 and v_2 for the following circuit shown in Fig. 4(b). CO3 Ap 5

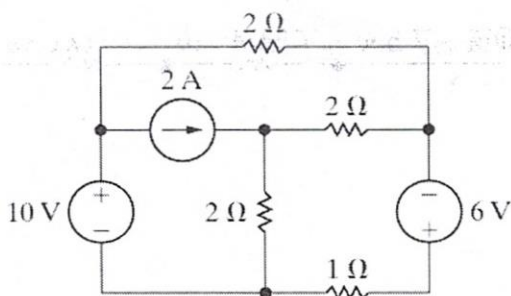


Fig. 4(a) Network for the question no 3a
(OR) (Mesh-Analysis)

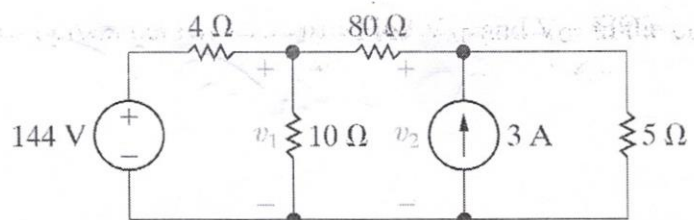


Fig. 4(b) Network for the question no 3b
(OR) (Nodal Analysis)