Roll No. .....

TEE–101

B. TECH. (FIRST SEMESTER)
MID SEMESTER EXAMINATION, Nov., 2022
BASIC ELECTRICAL ENGINEERING

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any ***one*** of the sub-questions.
(ii) Each sub-question carries 10 marks.

1. (a) Define the following AC terms : (CO1 & CO2)
   (i) RMS value
   (ii) Peak value
   (iii) Form factor
   (iv) Peak factor
   (v) Instantaneous value

OR

(b) Find out the voltages at nodes 1 and 2 using Nodal analysis as shown in Fig. 1 : (CO1 & CO2)

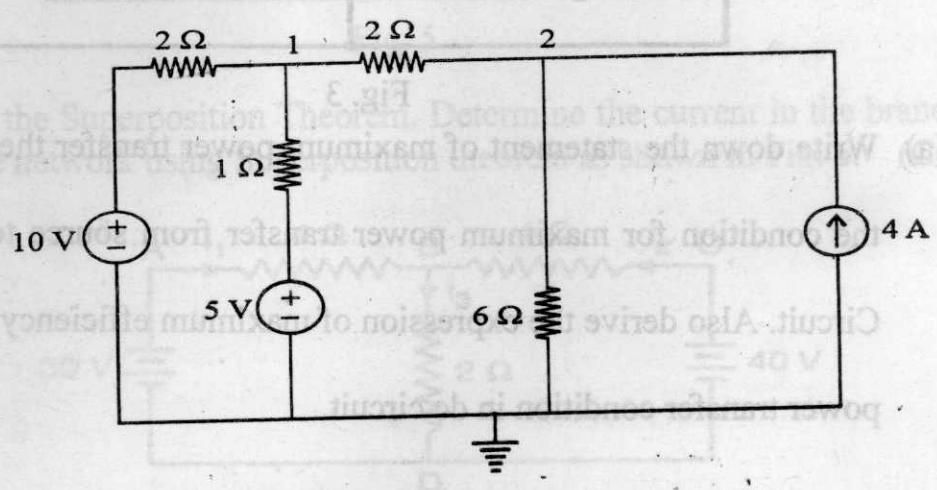

Fig. 1

P. T. O.

2. (a) State the Norton's theorem. Use source transformation technique to find the load current 'I' in the circuit shown in Fig. 2 : (CO1)

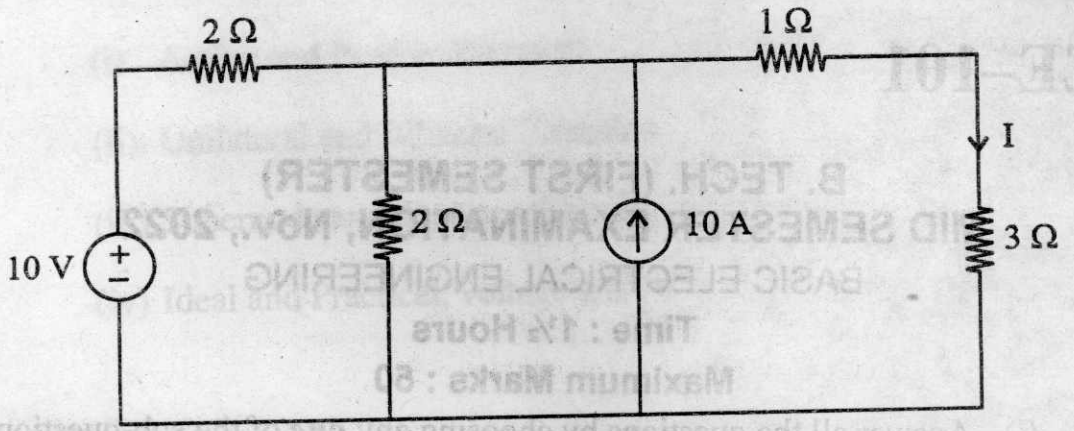

Fig. 2

OR

(b) Write down all the required steps for Mesh analysis. Find the current across 2Ω resistor as shown in Fig. 3 by using mesh analysis. (CO1)

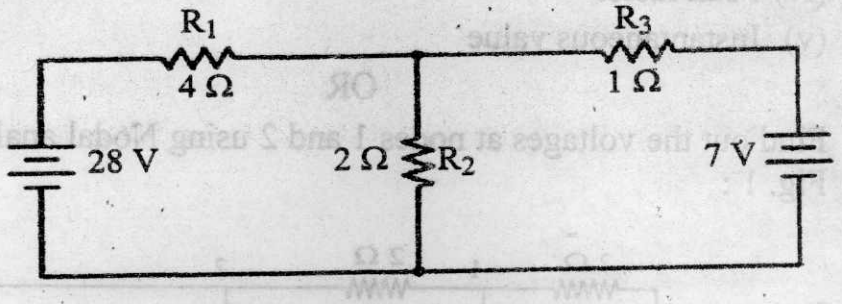

Fig. 3

3. (a) Write down the statement of maximum power transfer theorem. Derive the condition for maximum power transfer from source to load in DC Circuit. Also derive the expression of maximum efficiency in maximum power transfer condition in dc circuit. (CO1)

OR

(b) Determine the current through 15Ω resistor using Thevenin's theorem as shown in Fig. 4 : (CO1)

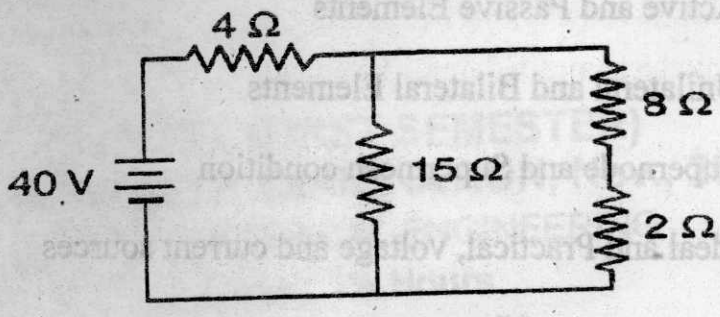

Fig. 4

4. (a) What are star and delta configurations ? Derive the expressions for star to delta and delta to star transformations in a two terminal dc circuit. (CO1)

OR

(b) Calculate current through 20Ω resistor using Norton's theorem in the circuit shown in Fig. 5 : (CO1)

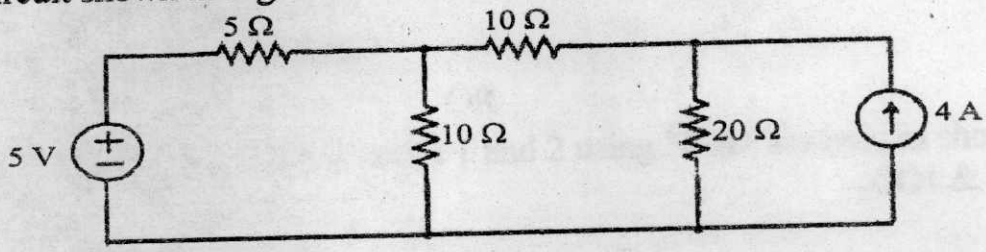

Fig. 5

5. (a) State the Superposition Theorem. Determine the current in the branches of the network using Superposition theorem as shown in Fig. 6. (CO1)

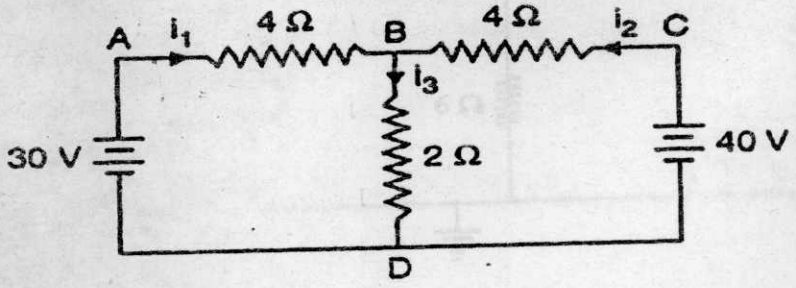

Fig. 6

P. T. O.

OR

(b) Define the following terms along with suitable examples : (CO1)

(i) Active and Passive Elements

(ii) Unilateral and Bilateral Elements

(iii) Supernode and Supermesh condition

(iv) Ideal and Practical, voltage and current sources