Subject Code:ES103 **ENROLLMENT NO.....**

MID TERM EXAMINATION-November 2022

Basic Electrical Engineering (SET B)

Time: 01Hr **Maximum marks: 30**

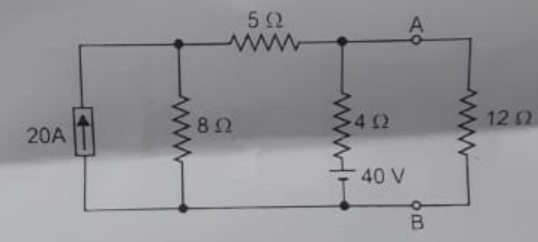
Note: Attempt questions as directed.

Calculators are allowed.

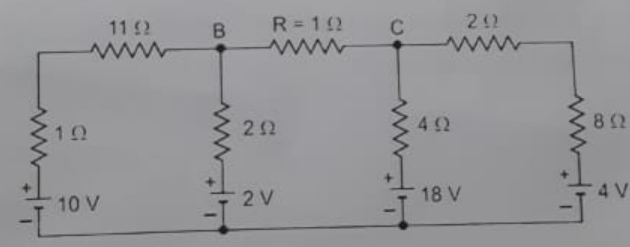
SECTION-A (Attempt any two questions, Each of 05 Marks)

Q.1. State and Verify Superposition Theorem.

Q.2. Draw Norton's equivalent circuit at terminals AB and determine the current flowing through 12Ω resistor for the network shown in Fig.



Q.3. Find Thevenin's equivalent circuit at terminals BC of Fig. Hence determine current through the resistor R = 1Ω.

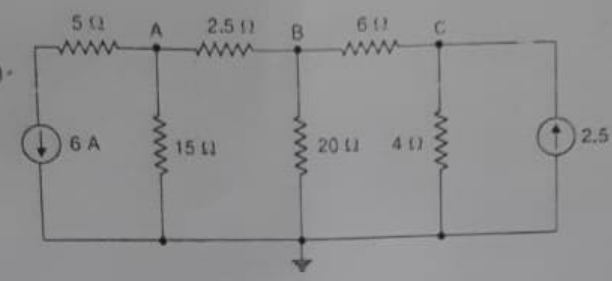


SECTION-B (Attempt any One question, 10 Marks)

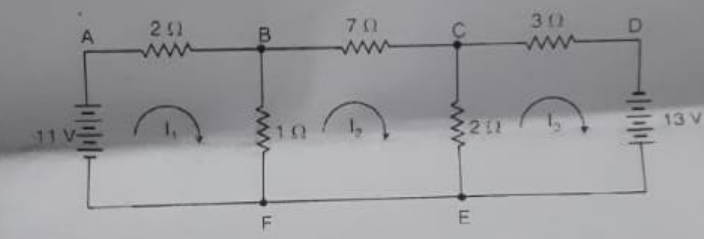
Q.1. State using nodal analysis, find the voltages at nodes A, B and C with respect to the reference node shown by the ground symbol in Fig.

$+150I_1 + 300I_2$

$-100I_2 = 0.$



Q.2. In the network shown in Fig, find the magnitude and direction of current in the various branches by mesh current method.



SECTION-C (Compulsory, 10 Marks)

Q.1 State and Prove Maximum Power Transfer Theorem. Also

i. Prove that circuit efficiency at maximum power transfer is only 50%.

ii. Prove that the load voltage is one-half of the open-circuited voltage at the load terminals.

iii. Prove that Maximum Power = $\frac{V_{TH}^2}{4R_{TH}}$

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