

[6186]-514

S.E. (ELECTRONICS/E&TC) (Insem)
ELECTRICAL CIRCUITS
(2019 Pattern) (Semester - III) (204183)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) Answer Q1 or Q2 and Q3 or Q4.
- 2) Neat diagrams and waveforms must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Use of nonprogrammable calculator is allowed.
- 5) Assume Suitable data if necessary.

Q1) a) Using source transformation, convert the given network in fig.1 with a single current source and a resistor. [5]

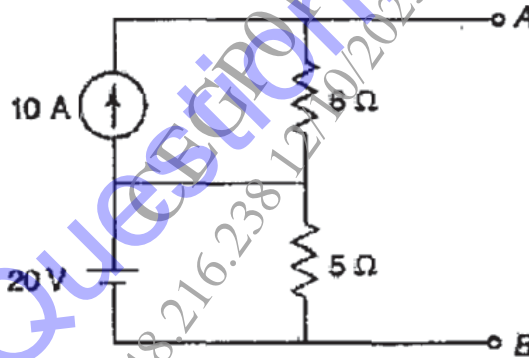


fig. 1

b) Using Nodal Analysis, determine the current through the 5Ω resistor for the network shown in fig.2 [5]

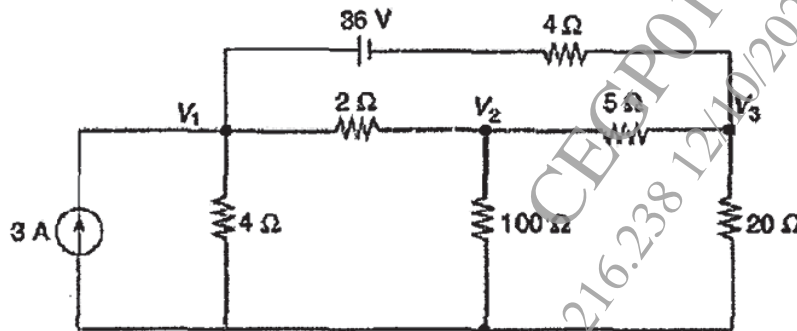


fig. 2

- c) Find the current in the 4Ω resistor shown in network of fig.3. [5]

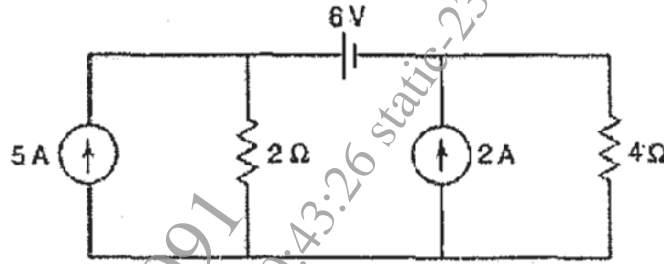


fig. 3

OR

- Q2) a) Using super mesh analysis, Find the current in the 3Ω resistor of the network shown in Fig.4. [5]

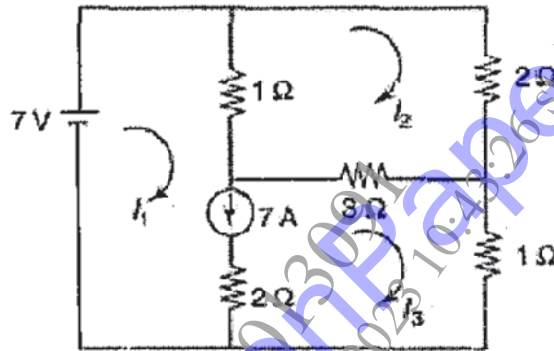


fig. 4

- b) Using superposition theorem, find the current through the 3Ω resistor in Fig.5 [5]

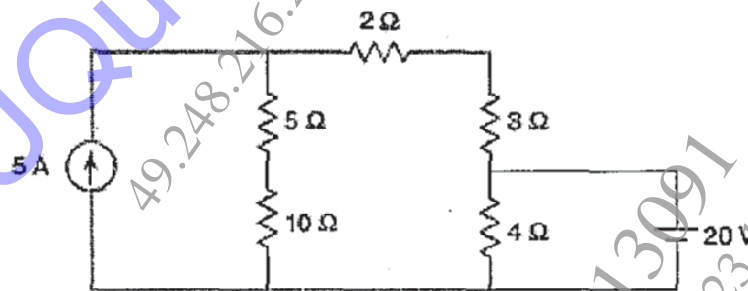


fig. 5

- c) State and explain Maximum Power Transfer theorem with suitable example. [5]

- Q3) a) What is the significance of Initial conditions? Write the note on initial conditions in the basic circuit elements. [7]

- b) In the given network of fig.6, the switch is closed at $t = 0$. With zero current in the inductor, find i , di/dt and di^2/dt^2 at $t = 0^+$. [8]

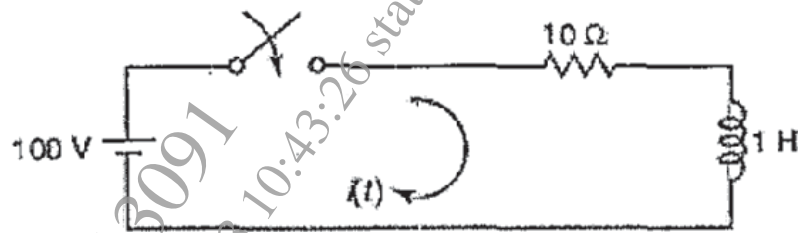


Fig. 6

OR

- Q4) a) Derive the equation for the Complementary Solution for current through inductor for driven R-L Circuit. Draw natural Response of the Circuit for various values of t . [7]
- b) In the network of Fig.7 the switch is closed at $t = 0$. With the capacitor uncharged, find value for i , di/dt and di^2/dt^2 at $t = 0^+$. [8]



Fig. 7

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