Total No. of Questions : 4]

SEAT No. :

P-5388

[Total No. of Pages : 3

[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]**

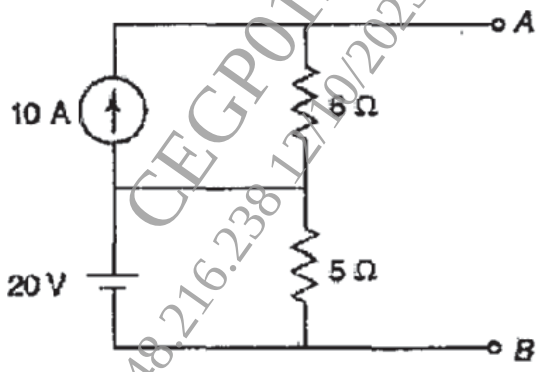

fig. 1

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

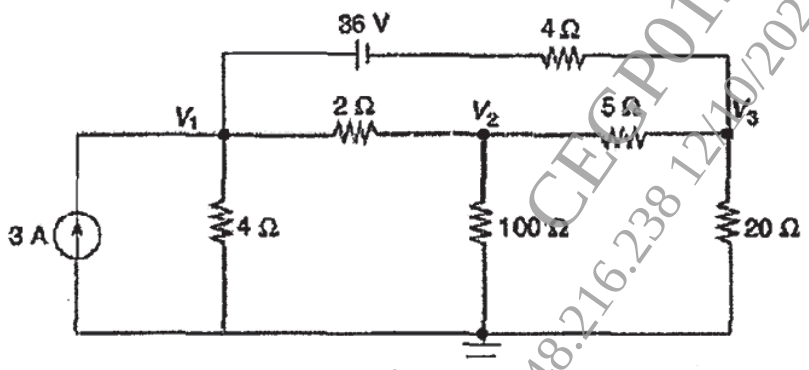

fig. 2

P.T.O.

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

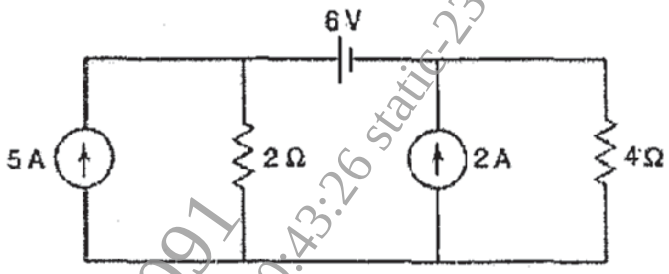

fig. 3

OR

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

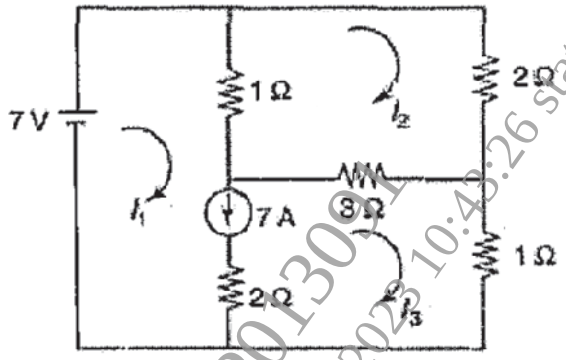

fig. 4

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

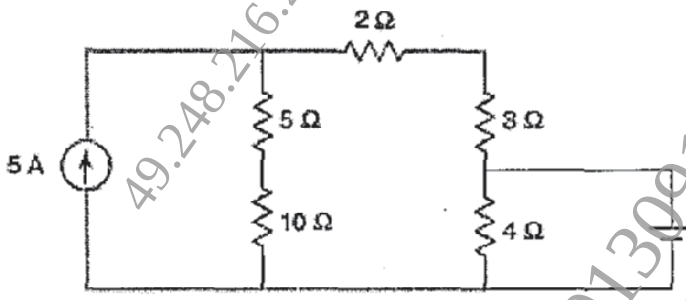

fig. 5

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]**

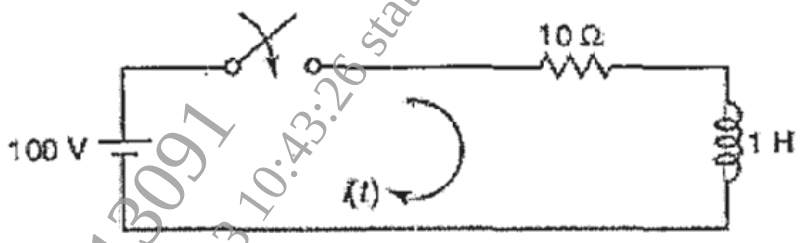

Fig. 6

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]**

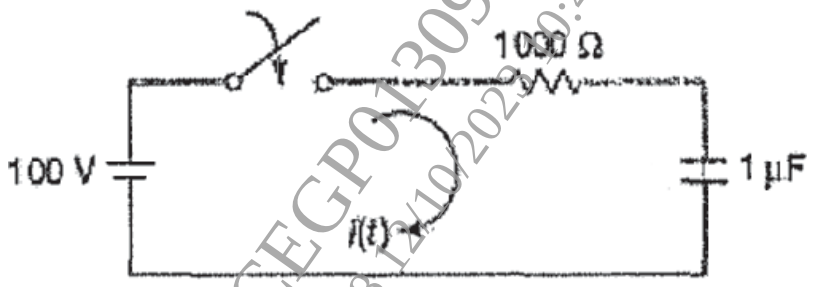

Fig. 7