Total No. of Questions : 4]

SEAT No. : ____

PA-6

[Total No. of Pages : 3

[5931]-9

S.E. (Electronics/Electronics & Telecommunication)

ELECTRICAL CIRCUITS

(2019 Pattern) (Semester - I) (204183)

Time : 1 Hour] ***[Max. Marks : 30***

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Using KVL, find the value of R in the Fig.a **[5]**

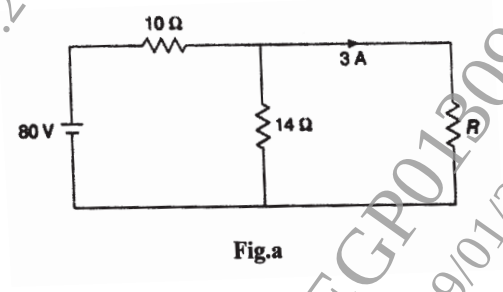

Fig.a

b) Using node analysis, find the node voltages V_1 and V_2 in the network of Fig.b **[5]**

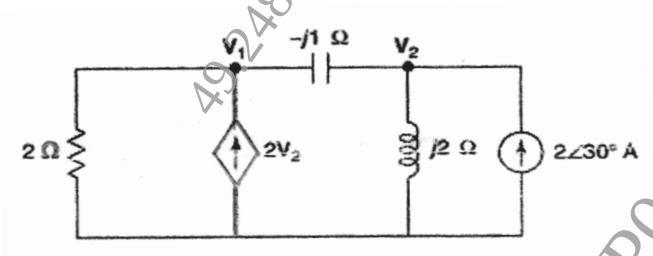

Fig.b

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

OR

P.T.O.

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

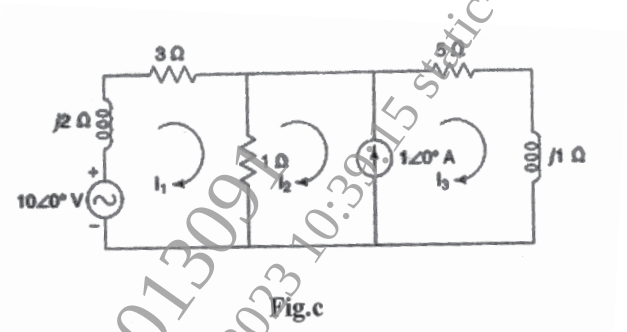

Fig.c

b) Using Thevenin's theorem, Find the current through the 2Ω resistor connected between terminals A and B in the Fig.d **[5]**

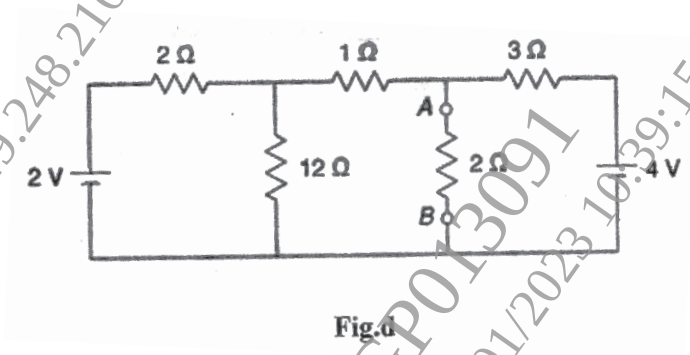

Fig.d

c) When to use superposition theorem? List out its applications and limitations. **[5]**

Q3) a) In the given network of Fig.e, the switch is closed at $t = 0$. With zero current in the inductor, find the values of i, di/dt, and d^2i/dt^2 at $t = 0^+$. **[6]**

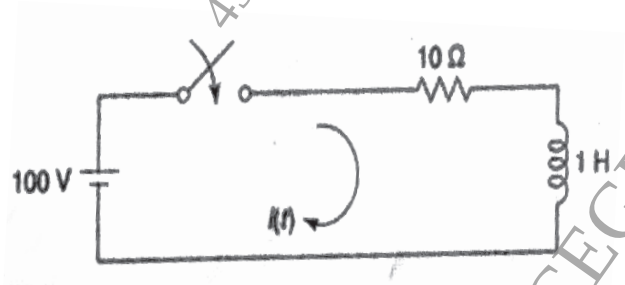

Fig.e

b) In Fig.f, the switch is closed at $t = 0$. Find $V_c(t)$ for $t > 0$. **[5]**

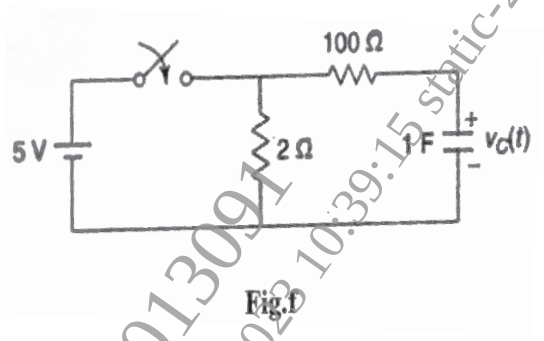

Fig.f

c) What is the significance of initial conditions? Explain initial condition for resistor, capacitor and inductor. **[4]**

OR

Q4) a) Write short note on underdamped, overdamped and critical damped systems. **[6]**

b) The network of Fig.g is under steady state with switch at the position 1. At $t = 0$, switch is moved to position 2. Find $i(t)$ **[5]**

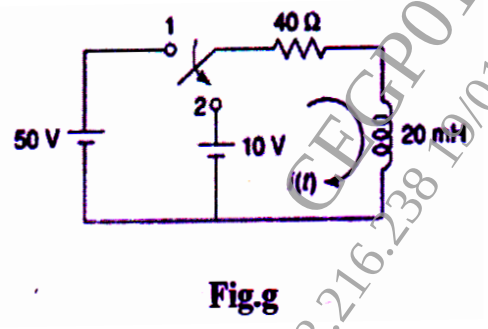

Fig.g

c) For the network shown in Fig.h, the switch is open for a long time and closes at t = 0. Determine $V_c(t)$. **[4]**

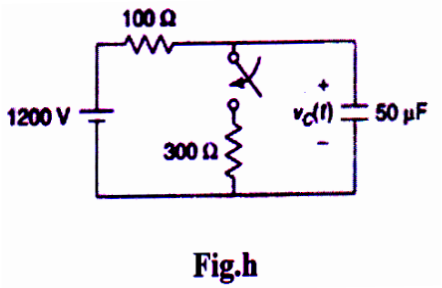

Fig.h

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