Department of Electrical Engineering

MOTILAL NEHRU NATIONAL INSTITUTE OF TECHNOLOGY ALLAHABAD

B.Tech. III Semester (End-Sem Exam)

Networks and Systems

Subject Code: EE-1301

MM: 60 Time: 3 Hrs

Note: (i) Attempt all question.
(ii) Each question carries equal marks.

1(a) Determine the power dissipated by the 10-Ω resistor in the circuit of fig.1 (5)

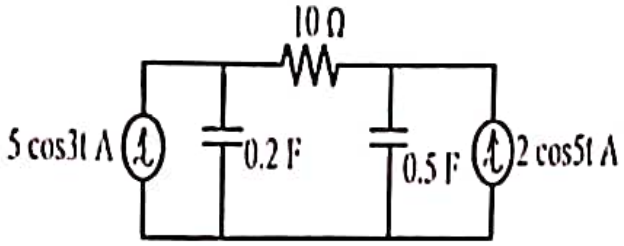


Fig.1

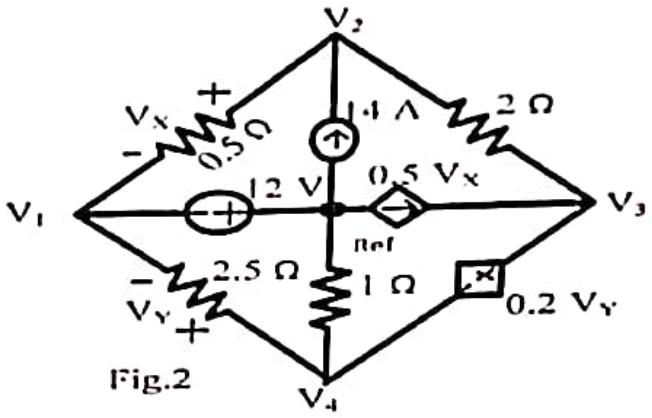


Fig.2

(b) Determine each node to reference voltages in the circuit of fig.2 (5)

2(a) Determine both I_1 and I_L in the circuit shown in fig.3 (5)

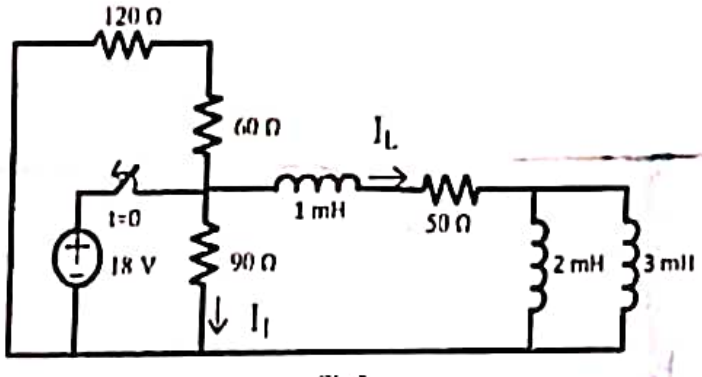


Fig.3

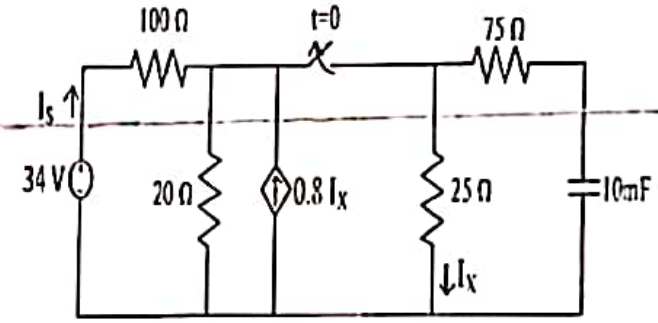


Fig.4

(b) After being in the configuration shown for a long time, the switch in fig.4 is opened at t=0. Determine values for $I_S(0^-)$, $I_X(0^-)$, $I_Y(0^-)$, $I_S(0^+)$ and $I_X(0.4\ s)$ (5)

3(a) By inspection, obtain the mesh-current equations for the circuit shown in fig.5 (5)

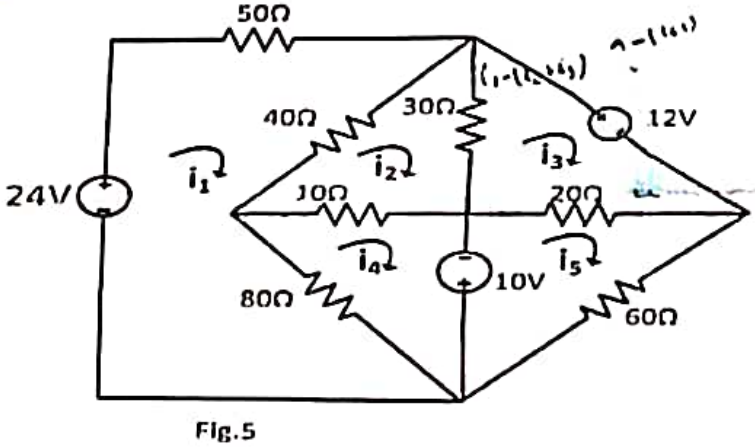


Fig.5

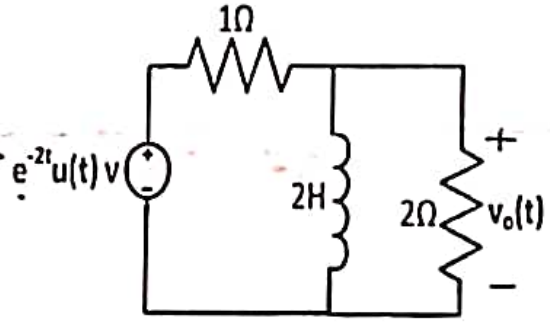
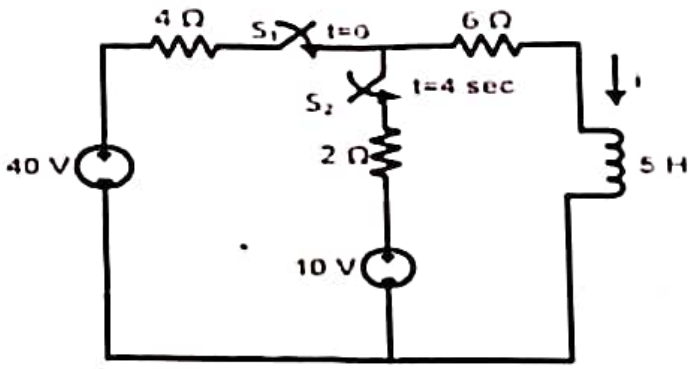


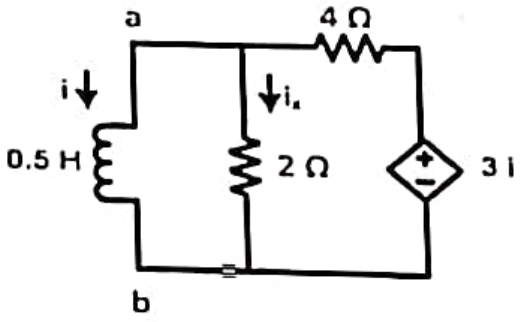
Fig.6

b) find $v_o(t)$ in the circuit shown in fig.6 (5)

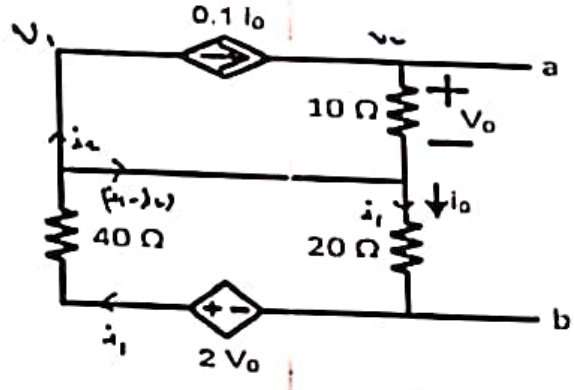
3. a. At t=0, switch 1 is closed, and switch 2 is closed at 4 sec later. Find i(t) for t>0. Calculate i for t=2 sec and t=5 sec.



b. Assuming that i(0)=10 A. Calculate i(t) and i_x(t) in the circuit.



4. a. Find the Thevenin equivalent of the circuit



b. Obtain the Norton equivalent at terminal a-b of the circuit