Total No. of Questions—8] [Total No. of Printed Pages—6

Seat No.	

[5352]-148

S.E. (Elect. Engg.) (Second Semester) EXAMINATION, 2018

NETWORK ANALYSIS

(2012 PATTERN)

Time : Three Hours **Maximum Marks : 50**

N.B. :— (*i*) Answer question Nos. Q. **1** *or* Q. **2**, Q. **3** *or* Q. **4**, Q. **5** *or* Q. **6**, Q. **7** *or* Q. **8**.

(*ii*) Neat diagrams must be drawn wherever necessary.

(*iii*) Figures to the right indicate full marks.

(*iv*) Use of calculator is allowed.

(*v*) Assume suitable data if necessary.

1. (*a*) For the network shown in Fig. 1. find the voltage V_{AB} using the nodal method. [6]

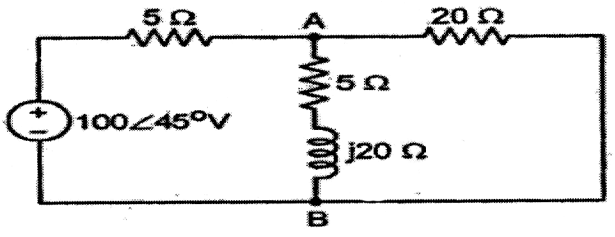

Fig. 1

P.T.O.

(*b*) Obtain Norton's equivalent network between terminals A and B as shown in Fig. 2. [7]

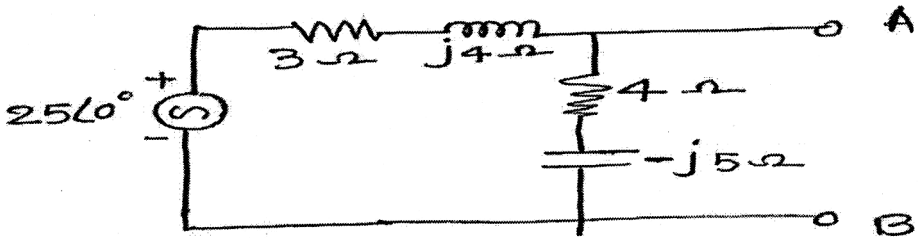

Fig. 2

Or

2. (*a*) Find current through $(3 - j4)\Omega$ by using Thvenin's Theorems as shown in Fig. 3. [7]

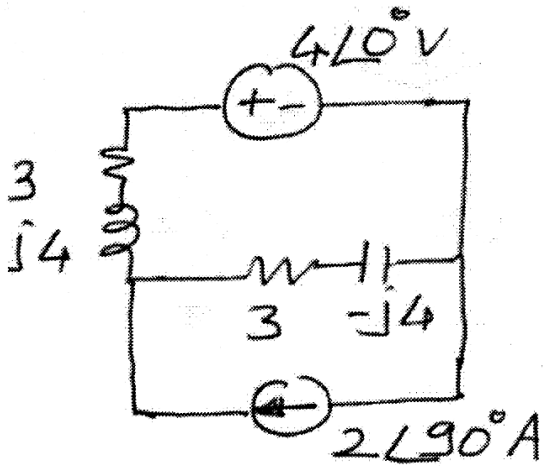

Fig. 3

(*b*) Find current through 5 ohm resistance by using Kirchhoff's voltage law (Refer Fig. 4). [6]

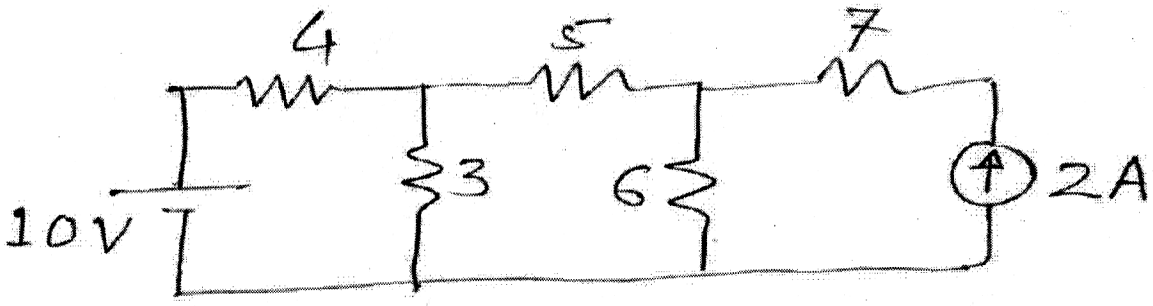

Fig. 4

3. (*a*) Find voltage V for t = 0.1 sec. after closing the switch at t = 0 (Refer Fig. 5) [7]

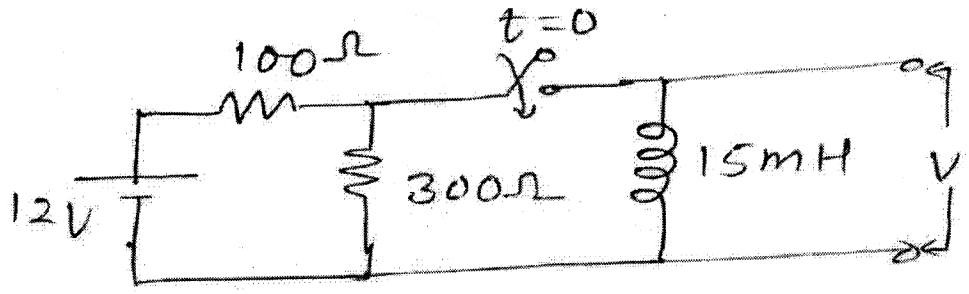

Fig. 5

(*b*) Write short notes on initial and final conditions. Justify your answers. [6]

Or

4. (*a*) After being on position 1 for long time, the switch is thrown on position 2 at time $t = 0$, find current using Laplace Transform technique (Refer Fig. 6). [7]

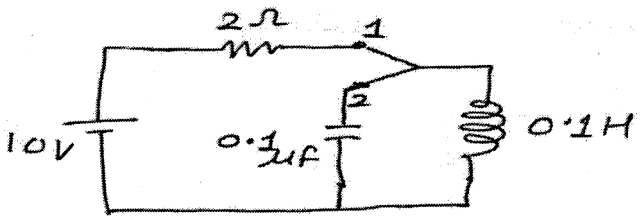

Fig. 6

(*b*) The switch is closed at time $t = 0$, obtain the particular solution for current $i(t)$ using Laplas Transform technique. Assume initial condition is zero (Refer Fig. 7). [6]

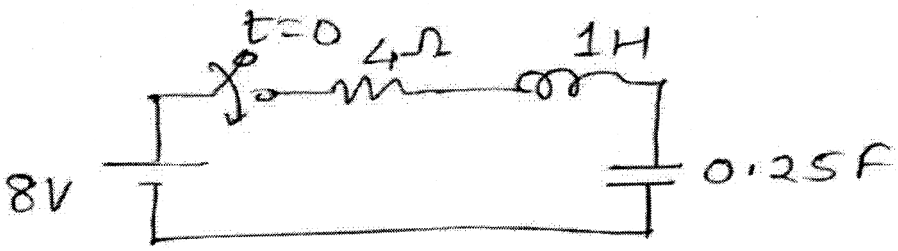

Fig. 7

5. (*a*) Find Z parameter for the circuit as shown in Fig. 8. [6]

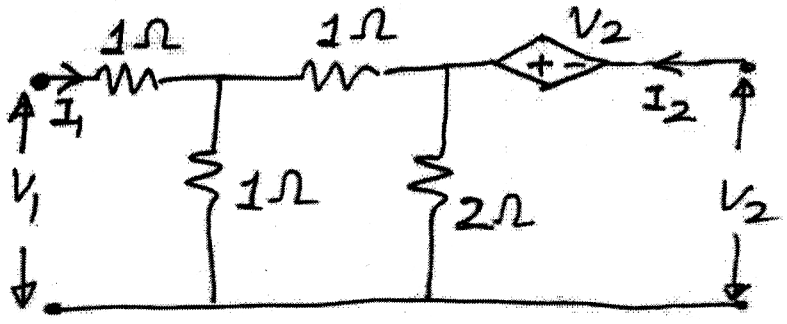

Fig. 8

(*b*) In the circuit shown in Fig. 9, find insertion loss in decibel in load resistance of 10 ohm. Inserted network is shown in dotted portion. [6]

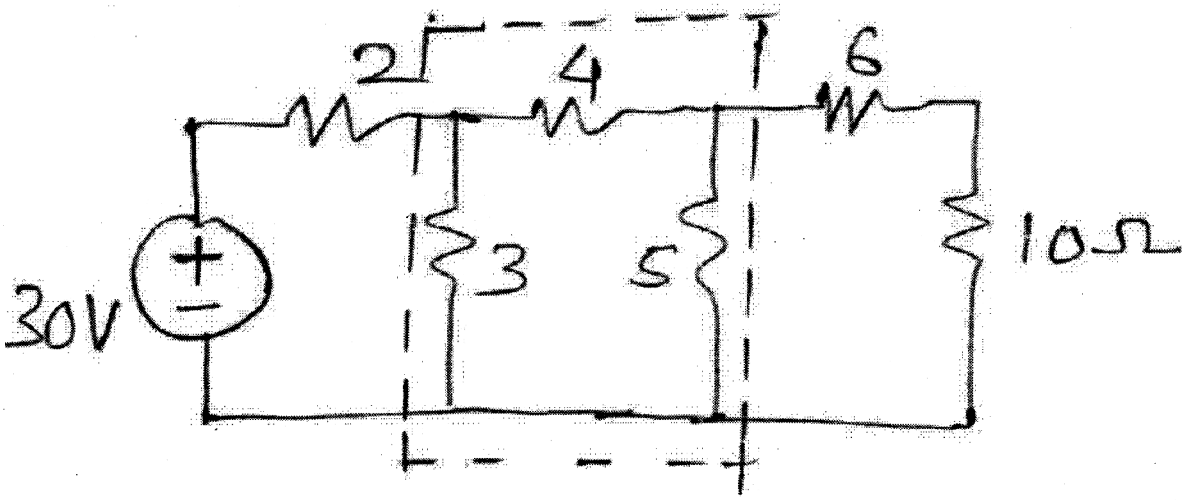

Fig. 9

Or

6. (*a*) If a constant *k* high-pass filter has cut-off frequency of 13 kHz and nominal impedance of R_0 = 600 ohm, Design the T and π sections of this filter. [6]

(*b*) Obtain Z parameter of network as shown in Fig. 10. [6]

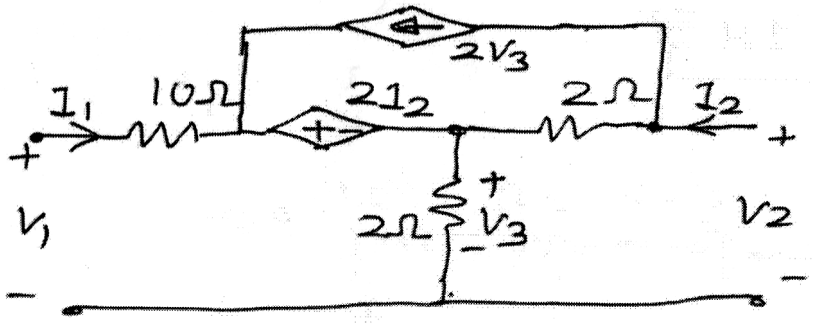

Fig. 10

7. (*a*) Find transfer function of network as shown in Fig. 11. [6]

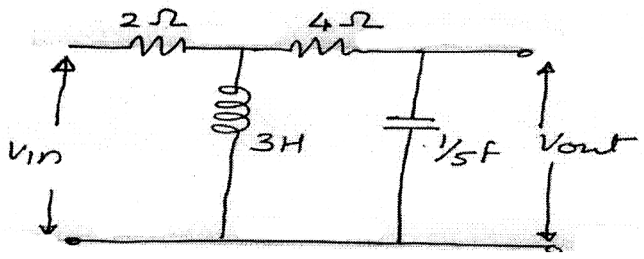

Fig. 11

(*b*) Draw the time domain wave form for various types of transfer function and comment on stability of system. [6]

Or

8. (*a*) Find poles and zero of the impedance of the following network and plot them on the s-plane in Fig. 12. [6]

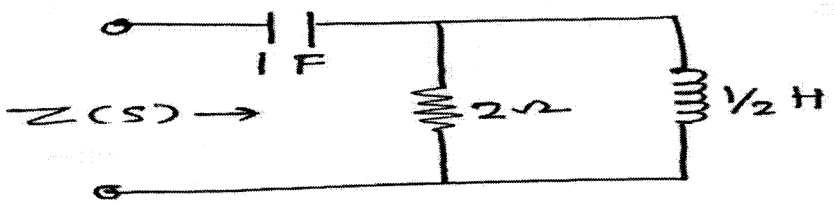

Fig. 12

(*b*) Explain parallel resonance condition drive the formula for anti-resonant frequency. [6]