Total No. of Questions—**8**] [Total No. of Printed Pages—**4+1**

Seat No.	

[5152]-548

S.E. (Electrical Engineering) (Second Semester)

EXAMINATION, 2017

NETWORK ANALYSIS

(2015 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. :— (*i*) Answer Q. No. **1** or **2**, Q. No. **3** or **4**, Q. No. **5** or **6**, Q. No. **7** or **8.**

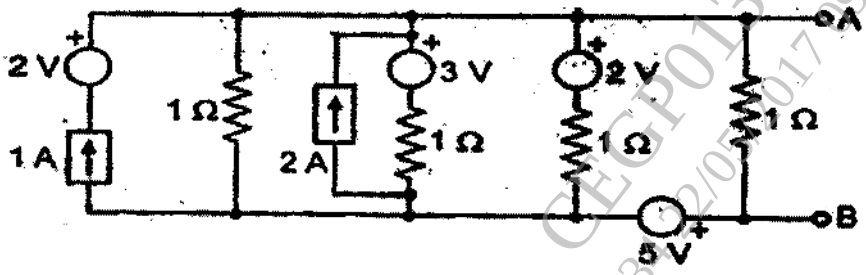
(*ii*) Neat diagrams must be drawn wherever necessary.

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

(*iv*) Use of calculator is allowed.

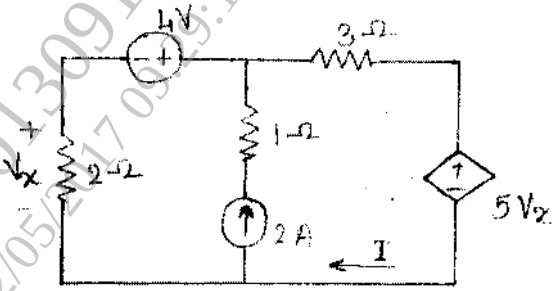
(*v*) Assume suitable data, if necessary.

1. (*a*) Reduce the given network figure to a single voltage source and impedance. [6]



P.T.O.

(*b*) In the circuit shown, find current I, using superposition theorem. [7]



Or

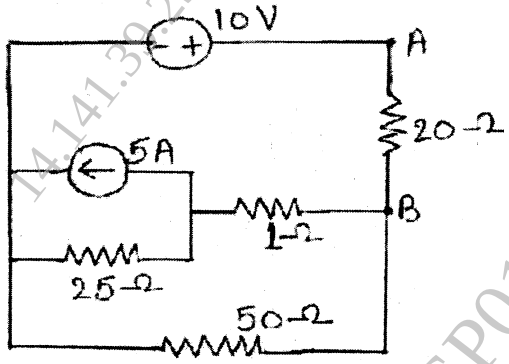
2. (*a*) Explain the following terms in relation with network graphs : [6]

(*i*) Tree

(*ii*) Cut set

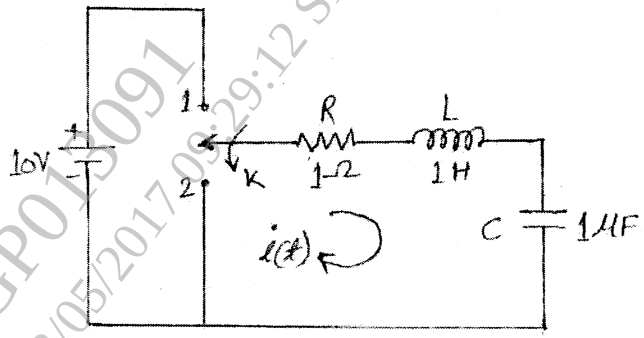
(*iii*) Tie set.

(*b*) Use Thevenin's theorem to calculate current through branch A-B as shown in figure below. [7]

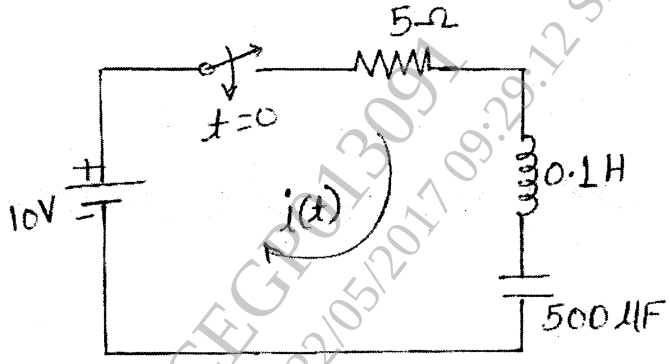


3. (*a*) As shown in circuit, switch K is changed from position 1 to position 2 at time t = 0, steady state condition reached before

switching. Find I, di/dt, di^2/dt^2 at $t = 0^+$. [6]

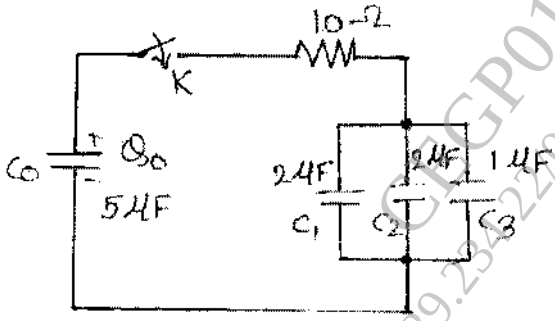


(*b*) Using Laplace transform find $i(t)$ in the network if initial conditions are zero. [6]

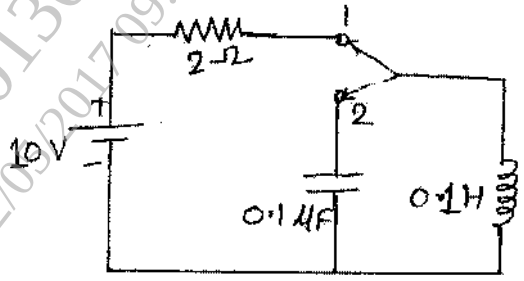


Or

4. (*a*) A 5μF capacitor is initially charged with 500μC. At $t = 0$, the switch K is closed. Determine the voltage drop across the resistor at $t < \tau$ and at $t = \infty$. [6]

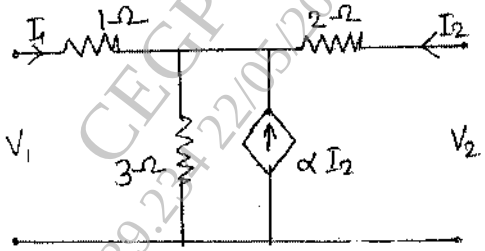


(*b*) After being on position 1 for long time, the switch is thrown on position 2 at time t = 0, find current using Laplace Transform technique. [6]



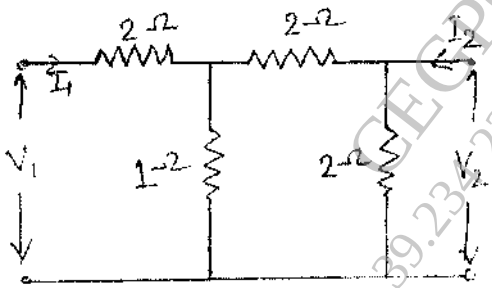
5. (*a*) Write a short note on location of poles and zeros on s-plane. [6]

(*b*) Find Z parameters for the network shown in figure. [7]

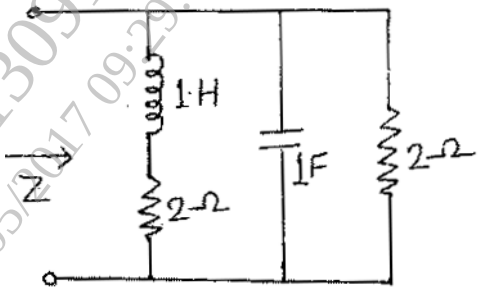


Or

6. (*a*) Find Transmission parameters for the network shown in figure. [6]



(*b*) Find the driving point impedance for the network shown in figure. [7]



7. (*a*) Derive the expression for characteristic impedance (Z_0), attenuation constant (α) and phase constant (β) of prototype constant-K type low pass filter from symmetrical networks. [6]

(*b*) Design a T and π section Constant-K low pass filter having cut-off frequency of 2KHz and design impedance $R_0 = 600\Omega$. Also find : [6]

(*i*) Its characteristic impedance at 12 KHz and

(*ii*) Attenuation at 4 KHz.

Or

8. (*a*) Explain the following terms in relation with filter : [6]

(*i*) Pass band

(*ii*) Stop band

(*iii*) Cut-off frequency.

(*b*) Design constant K-low pass filter to have a cut-off frequency of 796 Hz when terminated in a 600Ω resistance, in both the T and π configurations. [6]