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

Seat No.	

[5252]-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* Q. No. **2**, Q. No. **3**, *or* Q. No. **4**, Q. No. 5 *or* Q. No. **6**, Q. No. **7** *or* Q. No. **8**.

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

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

(*iv*) Use of calculator is allowed.

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

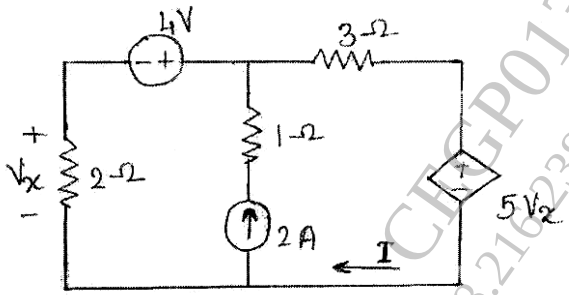
1. (*a*) Explain the following terms in relation with network graphs : [6]

(*i*) Tree

(*ii*) Cut set

(*iii*) Tie set.

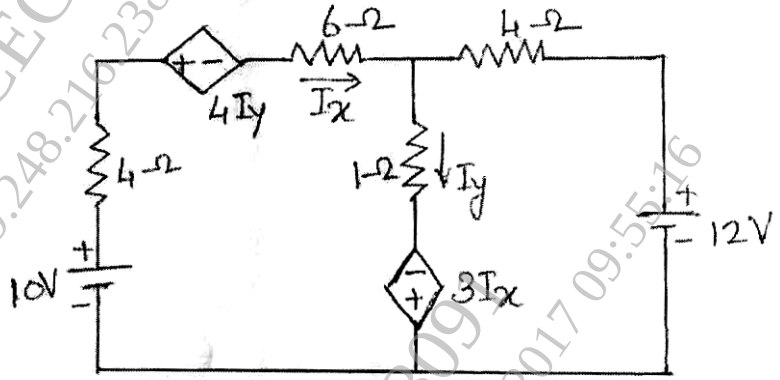
(*b*) In the circuit shown, find current I, using superposition theorem. [7]



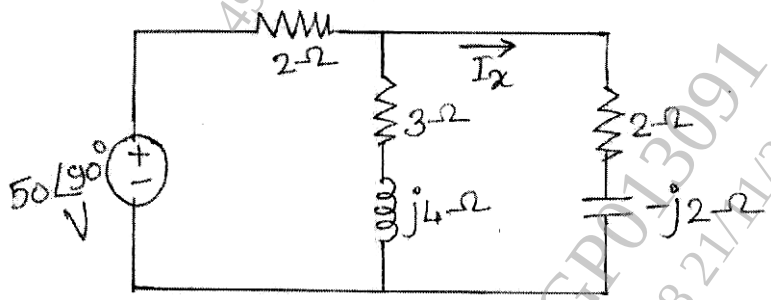
P.T.O.

Or

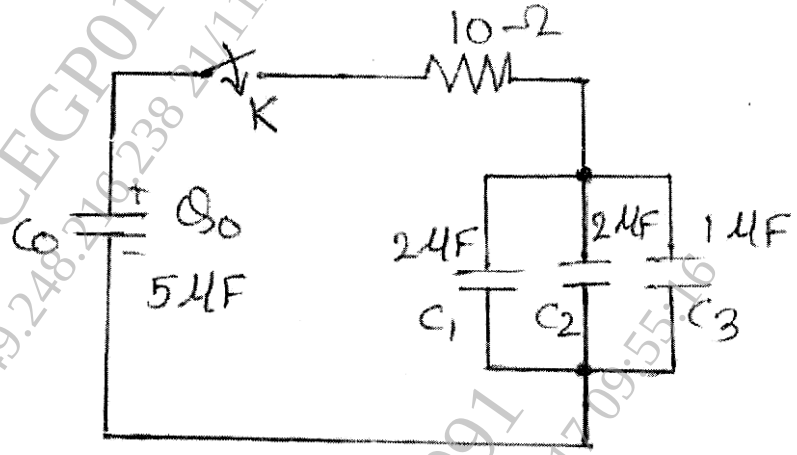
2. (*a*) Find current I*x* and I*y* for the circuit shown in figure using mesh analysis. [6]



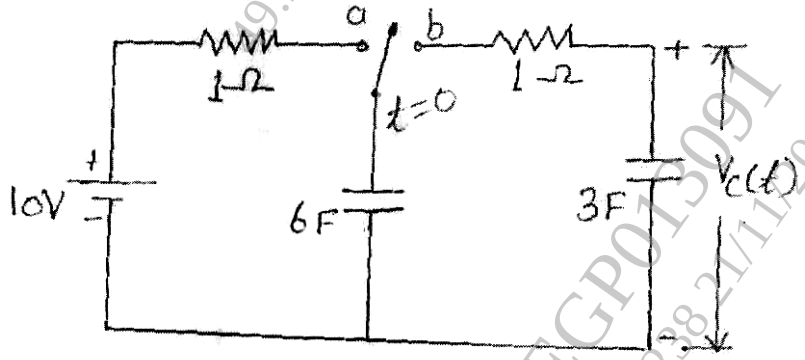
(*b*) Verify the reciprocity theorem for the voltage source and current I*x* for the circuit shown in figure. [7]



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

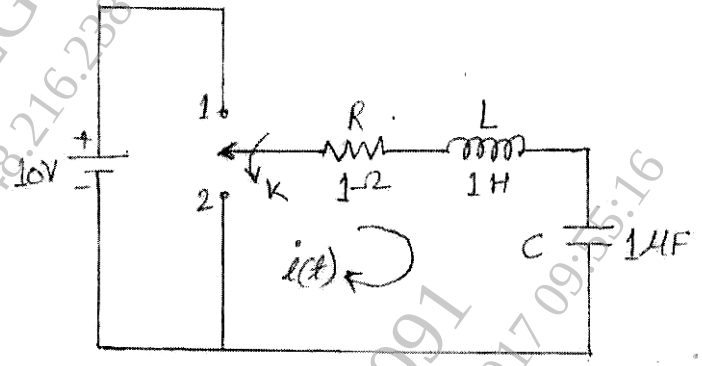


(*b*) In the network shown in figure the switch is moved from position *a* to *b* at $t = 0$. Determine $i(t)$ and $V_c(t)$ using Laplace transform. [6]

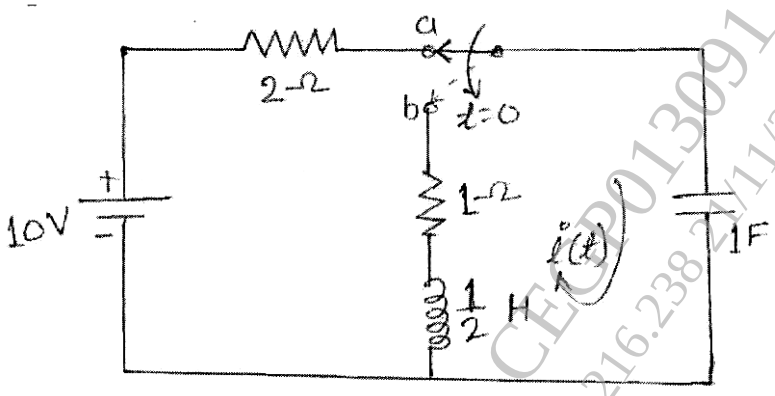


Or

4. (*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, d^2i/dt^2 at $t = 0^+$. [6]

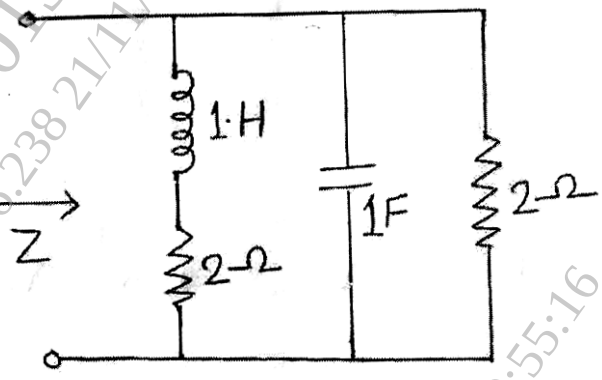


(*b*) In the network shown in figure was in a position '*a*' for long time and moved to position '*b*' at $t = 0$. Find the current through the capacitor for $t > 0$ using Laplace transform. [6]



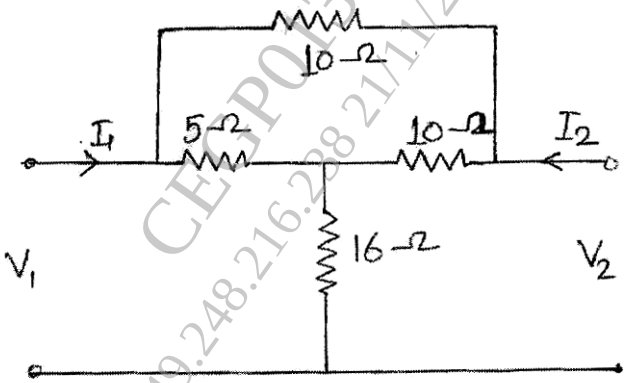
5. (*a*) Develop the relationship between transmission parameter and Y parameters. [6]

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

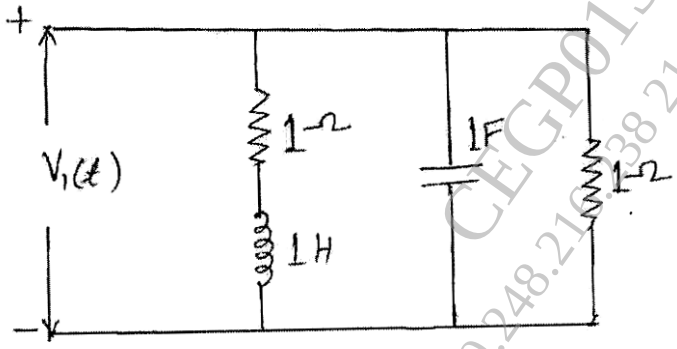


Or

6. (*a*) Find Z parameter of the network shown in figure. [6]



(*b*) Find the driving point admittance $Y_{11}(s)$ for the network shown in figure, and plot pole zero diagram. [7]



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

(*i*) Pass band

(*ii*) Stop band

(*iii*) Cut-off frequency

(*b*) Design a T and π section Constant-K high pass filter having cut-off frequency of 12 kHz and nominal impedance R_0= 500Ω. Also find : [6]

(*i*) its characteristic impedance and phase constant at 24 kHz and

(*ii*) attenuation at 4 kHz

Or

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

(*b*) Design constant –K high pass filter T and π section having f_c = 5 kHz and nominal characteristic impedance R_0 = 600 Ω. [6]