M 25934

Reg. No. : .....

Name : .....

Third Semester B.Tech. (Reg./Sup./Imp. – Including Part Time) Degree Examination, November 2014

(2007 Admn. Onwards)

PT2K6/2K6EC/AEI 305 : NETWORK THEORY

Time : 3 Hours Max. Marks : 100

Instructions : *Answer **all** questions.*
***Assume** missing data.*

I. a) Distinguish between a first order and second order system with the help of examples. **5**

b) Find the value of 'R' in the circuit such that maximum power transfer occurs. **5**

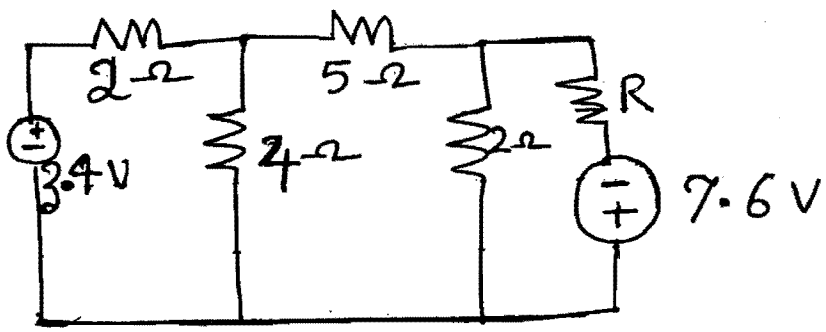

Fig. 1-b

c) Give any 3 properties of driving point functions. **5**

d) $F(S) = \frac{(S+5)}{S^2+6S+8)S}$, find f(t). **5**

e) Compare the features of M-derived and prototype filters. **5**

f) Draw the pole zero diagram for the network function $V(S) = \frac{S}{(S+1)(S+3)}$.

And also obtain v(t). **5**

P.T.O.

g) Give any 3 properties of positive real functions. **5**

h) Check whether the given polynomial is Hurwitz. Why ? **5**

$H(S) = (S + 3)(S + 5 + 5j)(S + 5 - 5j)$ **(8x5=40)**

II. a) Determine the current I in the circuit given below using superposition theorem. **15**

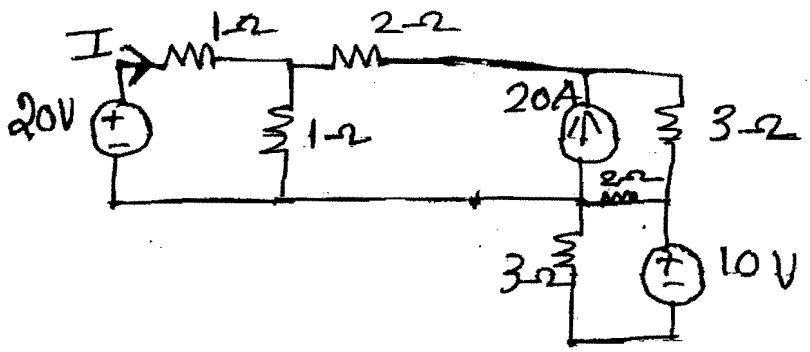

Fig. 2a

OR

b) Use Thevenin's theorem to find current through 10Ω resistor. **15**

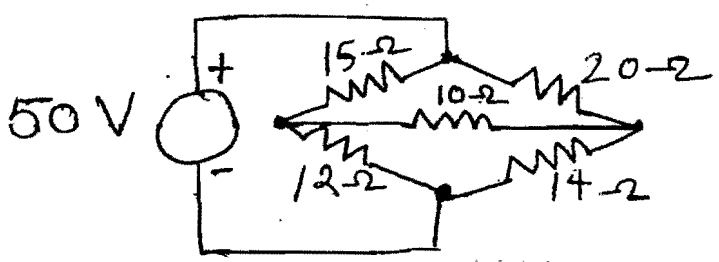

Fig. 2b

III. a) Find out the current i for $t \geq 0$, if $i(0) = 1$, for the given circuit. **15**

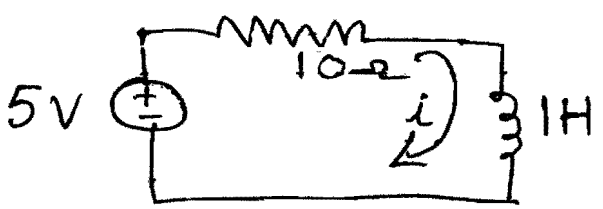

Fig. 3a

OR

b) Derive the expression for coefficient of coupling, for a pair of mutually coupled circuits. **15**

IV. a) Find the hand Y-parameters for the network given below : **15**

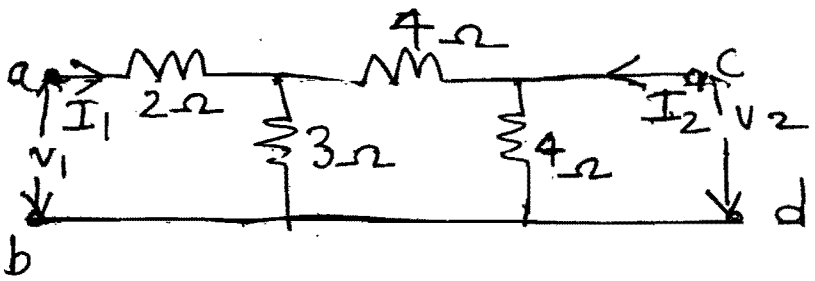

Fig. IV-a

OR

b) Design a M-derived LPF (I and II Section), having $R_o = 300\Omega$ $f_c = 2KHz$ and infinite attenuation frequency $f_\alpha = 3.5KHz$. **15**

V. a) Find the first Caur form and second Foster form of the network with driving point admittance $Y(S) = \frac{3(S+2)(S+5)}{S(S+3)}$. **15**

OR

b) Explain the significance of Hurwitz polynomial. What are its properties ? **15**