SE Sem III B-M (Rev) 12/12/2014

SE (Bio Med) – Sem III – CBSGS – ENA-S

12 DEC 2014

QP Code :14681

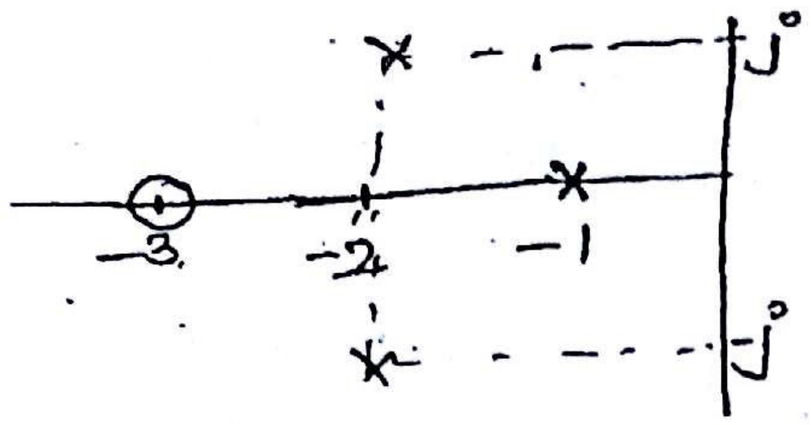
Sub: Electrical Network Analysis & Synthesis

(19)

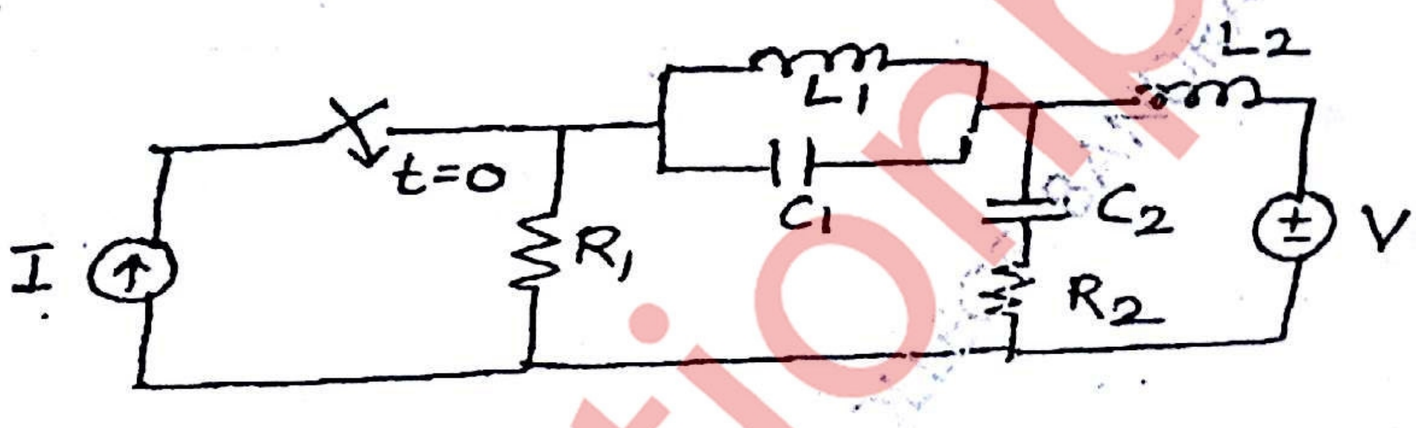
(3 Hours) **[Total Marks : 80**

N.B. (1) Attempt any **four** questions out of **six.**
(2) Assume any **suitable** data if **required.**
(3) **Figures** to the **right** indicate **full** marks.

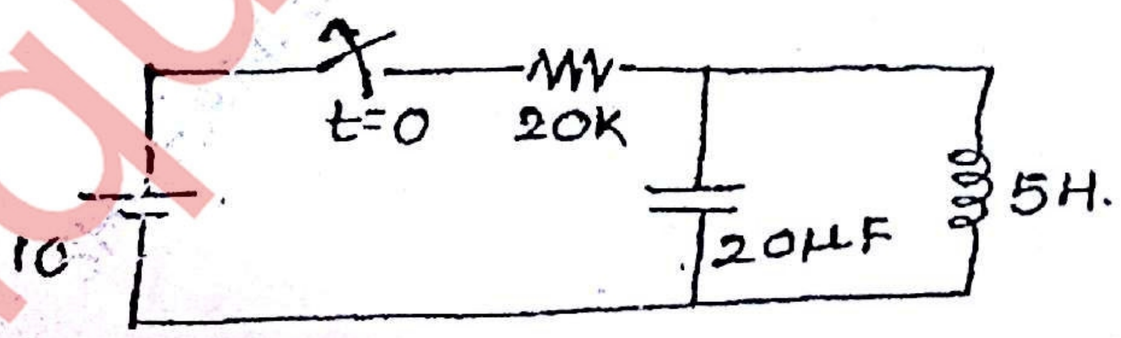
1. (a) Find system function for the given pole zero plot D.C. gain of the system is 10 **5**



(b) Draw dual of the following– **5**



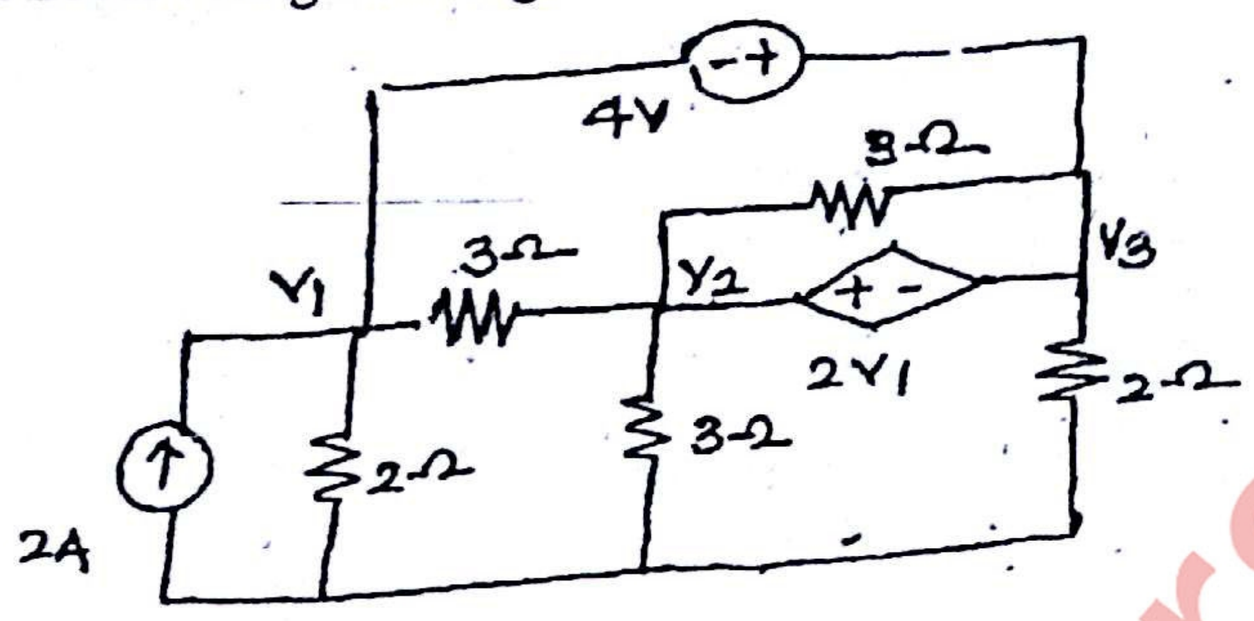
(c) For the given network s/w is closed and a steady state is reached. At t = 0 s/w is opened. Find $i_L(0^+)$, $V_c(0^+)$ & $\frac{di_L}{dt}(o^+)$ **5**



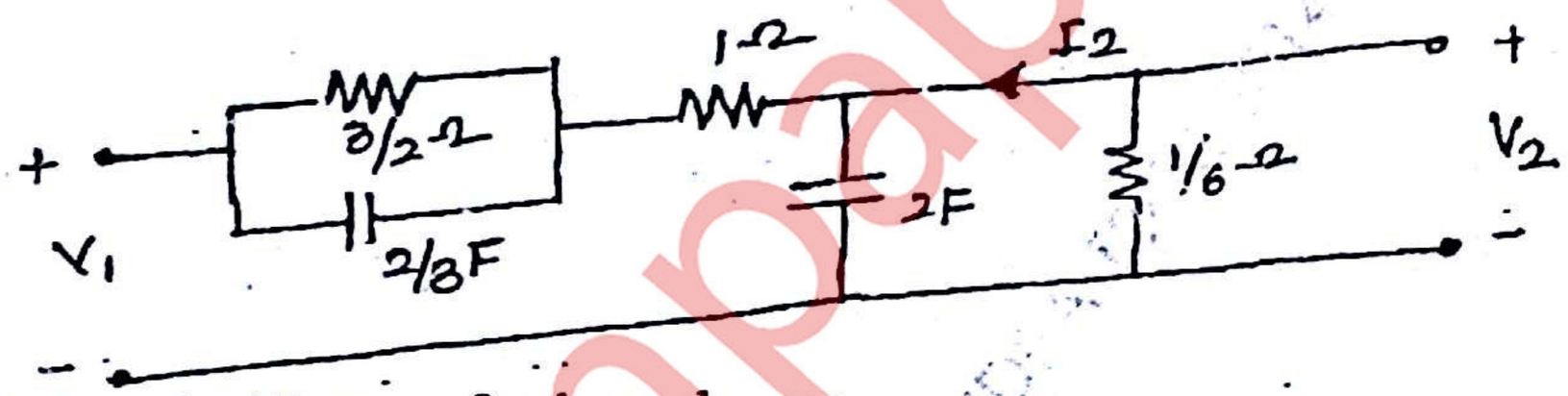
(d) Check the following function for Hurwitz. **5**

$F(s) = 3s^4 + 5s^3 + 1$

2. (a) Find condition of reciprocity for Y-parameters. 10
(b) Find nodal voltages for a given circuit. 10



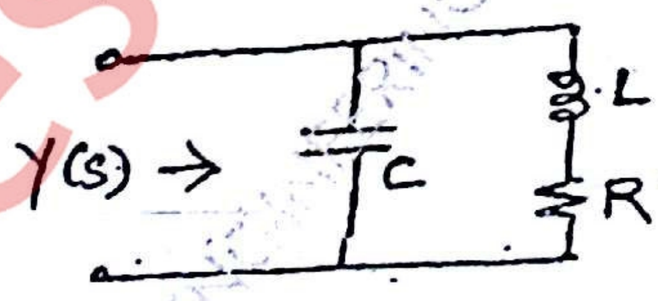
3. (a) For the ladder n/w shown. Show that, $\frac{I_2(s)}{V_1(s)} = \frac{K(s+1)}{(s+2)(s+4)}$ and find value of K. 10



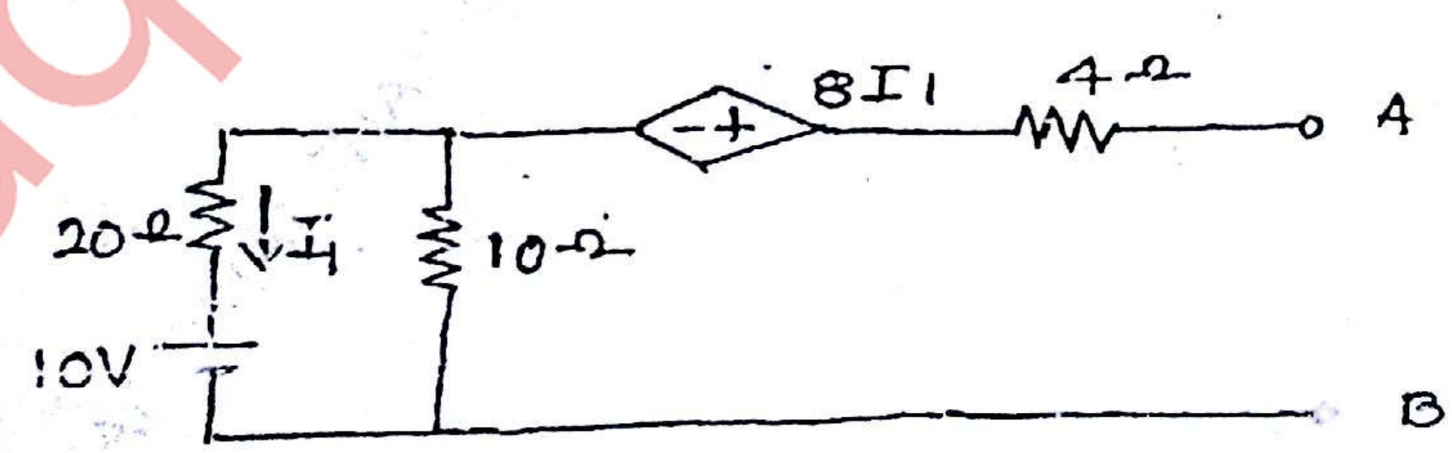
(b) Explain significance of poles and zeros. 10

4. (a) Admittance function of a given network is given by $Y(s) = \frac{K(s-s_1)(s-s_2)}{(s-s_3)}$. 15

(i) Express s_1, s_2 & s_3 in terms of R, L, & C.
(ii) If $s_1 = -10 + j10^4$ and $s_2 = -10 - j10^4$,
Find R, L & C if $y(j0) = 10^{-1}$.



(b) Find Thevenin's equivalent network between A & B. 5



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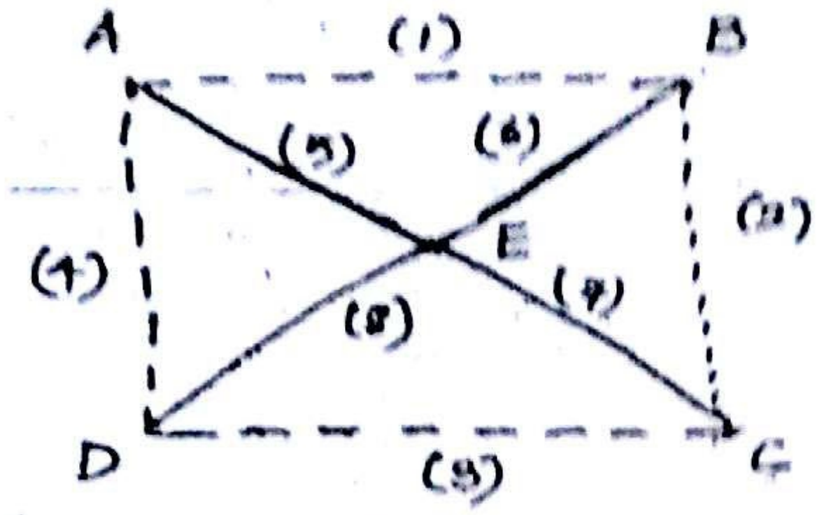
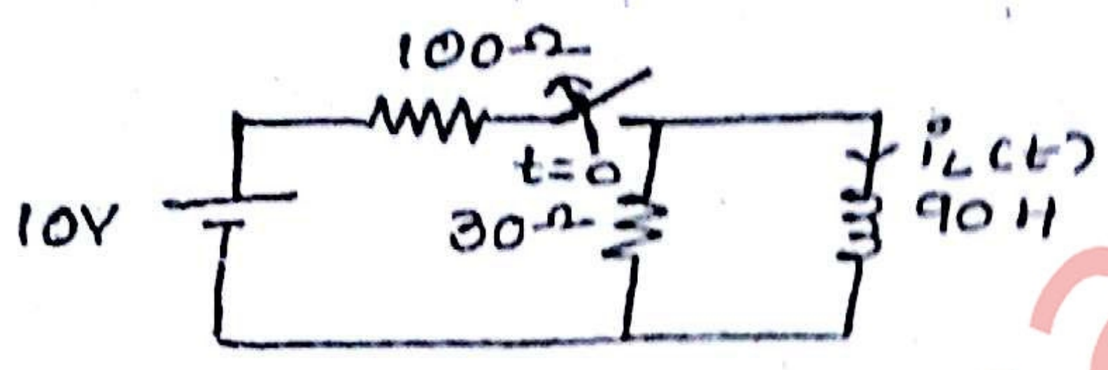
5. (a) Obtain incidence matrix, tieset matrix and f-cutset matrix for the graph given. 12



(b) For the network shown in Figure, steady state is reached with the switch closed. 8
The switch is opened at t = 0. Obtain expression for $i_L(t)$ for ≥ 0.



6. (a) Synsthessize the following function in Foster I form 10

(i) $Z(s) = \frac{2(s+1)(s+3)}{(s+2)(s+6)}$

(ii) $Z(s) = \frac{(s+1)(s+3)}{s(s+2)}$

(b) Synthesize the following functions in cauer II form. 10

(i) $Y(s) = \frac{s^4+6s^2+4}{2s^3+4s}$

(ii) $Z(s) = \frac{36+40s^2+4s^4}{4s+s^3}$.

GN-Con.: