Oct./TE/Insem. - 17
T.E. (Electronics)
NETWORK SYNTHESIS
(2012 Course) (Semester - I) (304205) (Elective - II)

Time : 1 Hour]   *[Max. Marks : 30*

Instructions to the candidates:
1) *Answer Q1 or Q2, Q3 or Q4 and Q5 or Q6.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to the right indicate full marks.*
4) *Use of calculator is allowed.*
5) *Assume suitable data, if necessary.*

Q1) a) Explain the physical significance of poles and zeros. **[5]**

b) Test the function is Hurwitz polynomial or not. **[5]**

$$F(s) = s^4 + s^3 + 2s^2 + 3s + 2$$

OR

Q2) a) Explain the following removal operation, **[6]**

i) Removal of pole at $S = \infty$ from the functions

ii) Removal of pole at $S = 0$ from the functions.

b) Test whether $F(s) = \dfrac{s^2 + 1}{s^3 + 4s}$ is positive real function. **[4]**

Q3) a) State the properties of RC Driving point function of one port network. **[4]**

b) Synthesize the following function using Foster - I and Cauer - I form

$$Z(s) = \frac{(s+1)(s+3)}{(s+2)(s+4)}$$ **[6]**

OR

Q4) a) State the properties of LC Driving point function of one port network. **[4]**

b) Synthesize the following function using partial fraction expansion method.

$$F(s) = \frac{2s^2 + 2s + 1}{s^3 + 2s^2 + s + 2}$$ **[6]**

P.T.O.

Q5) a) Write a short note on Zeros of transmission. **[4]**

b) Realize the following function, **[6]**

$$Z_{21} = \frac{s^3}{s^3 + 3s^2 + 4s + 2}$$

OR

Q6) a) Give the properties of the Transfer function. **[4]**

b) Realize the following function as symmetrical constant resistance lattice network terminated by $1\,\Omega$. **[6]**

$$\frac{V_o}{V_s} = \frac{1}{2}\frac{s^2 - 3s + 2}{s^2 + 3s + 2}$$

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