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Total No. of Pages : 03

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B.Tech.(ECE) (2012 to 2017) / (Electronics & Telecom Engg.)
(Sem.–3)

NETWORK ANALYSIS AND SYNTHESIS

Subject Code : BTEC-303
M.Code : 57585

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

a) Differentiate between Network Analysis and Network Synthesis and state the methods to solve them.

b) Define hybrid Parameters. Why they are called so?

c) Find F(t) if F(s) = $\frac{s+2}{(s+1)(s+5)}$.

d) Explain different types of standard input signals with mathematical equations and diagram.

e) Check the positive realness of

$$F(s)=\frac{2s^3+2s^2+3s+2}{s^2+1}$$

f) What are dependent and independent sources? List them and draw diagram.

g) Differentiate between the properties of RC and LC circuits.

h) Explain the difference between transient and steady state response.

i) Define reciprocity theorem and state its applicability.

j) Define convolution theorem of Laplace Transform.

SECTION-B

2. Find the current delivered to R_L using Thevenin theorem in Fig.1. Also verify your answer using Norton theorem.

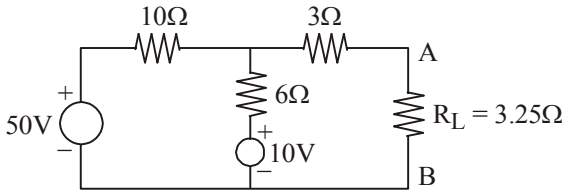

Fig.1

3. Find Y-parameters of the network of Fig. 2.

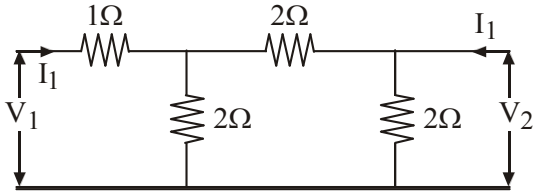

Fig.2

4. Steady state is achieved in the given circuit of Fig. 3. With switch, S open. Find the value of I(t) for $t > 0$, if switch S is closed at $t = 0$.

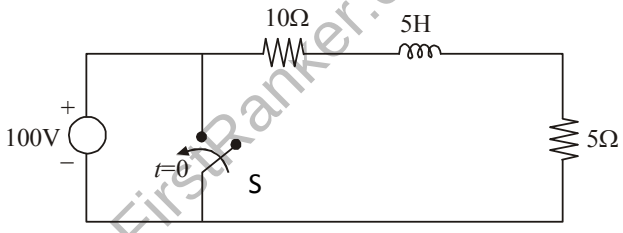

Fig.3

5. Using Mesh analysis, find I in the circuit of Fig. 4.

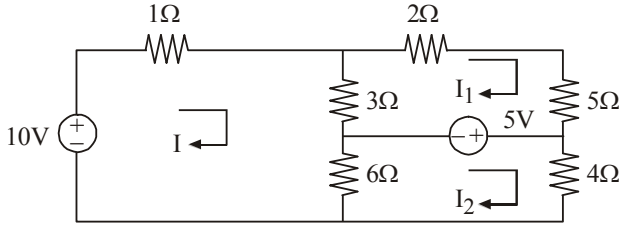

Fig.4

6. Classify filters and analyze any one type of filter in detail.

SECTION-C

7. Synthesize a network using foster-I and foster-II forms for the impedance function :

$$Z(s)=\frac{(s+1)(s+4)}{(s)(s+2)}$$

8. In the circuit shown in given Fig. 5, find the maximum power delivered to load R_L.

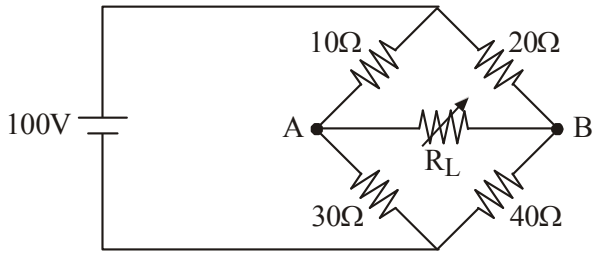

Fig.5

9. If a constant-K high pass filter has cut-off frequency of 10KHz and nominal impedance Ro is 700 Ω, design the T-and π-sections of this filter. Determine its characteristic impedance, phase constant at 25 KHz, and attenuation at 8KHz.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.