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Total No. of Pages : 03

Total No. of Questions : 09

B.Tech.(ECE / Electronics & Computer Engg. / ETE) (2011 Onwards)
B.Tech. (Electronics Engg.) (2012 Onwards) (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

Q1. Answer briefly :

a. State various properties of LC networks.

b. Define h-parameters and draw its equivalent h-model.

c. Find f(∞) if $F_{(s)} = \frac{5s+3}{s(s+1)}$

d. A series RL circuit has R = 10KΩ, L = 10mH and C = 1μF. Find the Transfer function of the circuit.

e. Check the positive realness of $F_{(s)} = \frac{s^2+50s+14}{s+12}$

f. Differentiate between Network Analysis and Network Synthesis. Name the methods to solve them.

g. Using nodal analysis in Fig. 1 find the value of current in 20 Ω resistor.

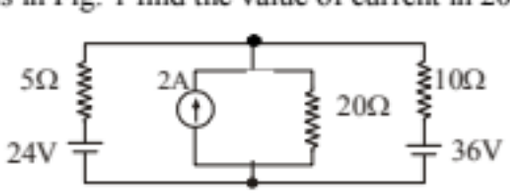

Fig.1

h. If two circuits X and Y are to be connected in cascade. Give the two port parameters of the combination with diagram cascade combination.

i. Find response of $H_{(s)}\dfrac{s^2+4s+3}{s^2+6s+8}$ for step input.

j. Find condition for a 2-port network using Z and Y-Parameters to be reciprocal.

SECTION-B

Q.2 Find the value of Z_L in Fig. 2 so that maximum power is transferred to it. Also find the value of maximum power transferred.

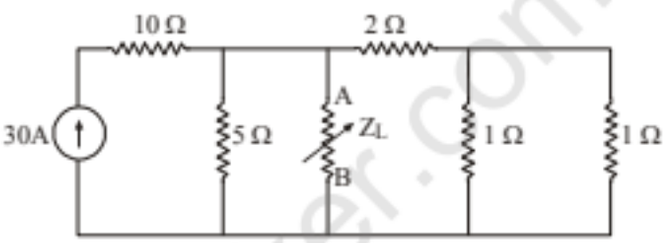

Fig. 2

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

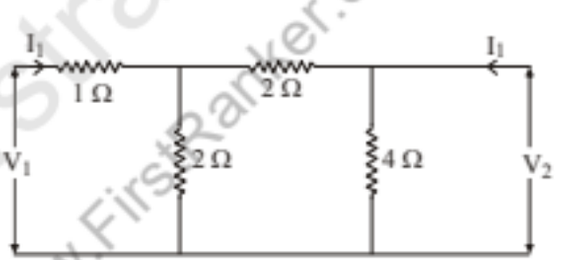

Fig. 3

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

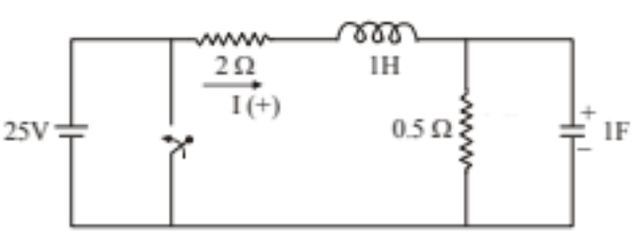

Fig. 4

Q.5 Using Nodal analysis, find I in the circuit of Fig. 5.

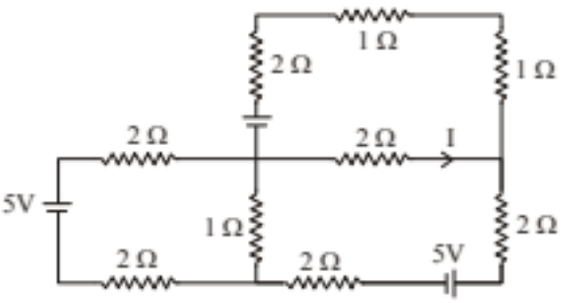

Fig. 5

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

SECTION-C

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

$$Z(s) = \frac{s(s^2+9)}{(s^2+5)(s^2+13)}$$

Q.8 If an m-derived high pass filter has design impedance of 500Ω and cut off frequency of 3.5 KHz and infinite attenuation at 2.6 KHz, design the filter.

Q.9 Find current through Z_L in Fig. 6 using Norton's theorem and verify the result using Thevenin Theorem.

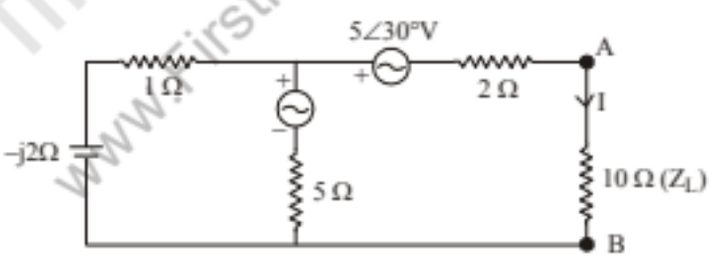

Fig. 6

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.