Roll No. | | | | | | | | | | | |

Total No. of Pages : 02

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

Paper ID : [A1127]

Time : 3 Hrs. **Max. Marks : 60**

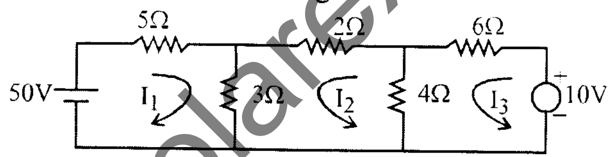
INSTRUCTIONS TO CANDIDATES :

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. Write briefly :

1. Define step function and ramp function. What are their Laplace transform?
2. Write the loop equations of a following network.



3. Write down the necessary conditions for driving point function.
4. State maximum power transfer theorem and derive the relation to calculate maximum power.
5. What is role of design impedance in prototype filters? What is the range of m in m-derived filters.
6. What are
   a) Active and passive elements
   b) Lumped and distributed elements
7. What are the applications of Laplace transform? Write Laplace transform of $f(t) = A \sin t$.
8. Plot the poles and zeros of a network function on the s-plane

   $N(s) = (s+1)(s+5)/(s+3+2j)(s+3-2j)$

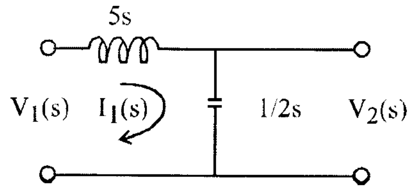
   And check the stability of the system.

9. What is meant by the term analysis and synthesis of networks?

10. Differentiate between supernode and supermesh.

SECTION-B

2. What are transfer functions? Determine the transfer functions $G_{21}(s)$ and $Z_{21}(s)$ and the driving point admittance $Y_{11}(s)$.



3. Explain different types of energy sources. Discuss the applications of dependent energy sources.

4. Explain transient response of series RLC circuit with dc input supply.

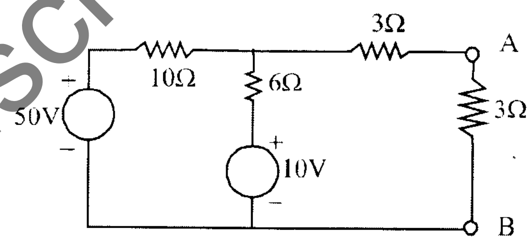
5. Write short note on composite filters.

6. Find the inverse Laplace of

$f(s) = (s+1)/s(s+2)$

SECTION-C

7. Find the current flowing in branch AB using thevenin theorem. Verify the result by superposition theorem.



8. Design m-derived low pass filter having cut off frequency of 1 KHz, design impedance of 400 ohm, and the resonant frequency 1100 Khz.

9. Find the first and second Cauer forms of the function

$Z(s) = (s+1)(s+3)/s(s+2)$