PAPER ID-311265

Roll No: | | | | | | | | | | | | | |

B TECH
(SEM-III) THEORY EXAMINATION 2020-21
NETWORKS ANALYSIS & SYNTHESIS

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

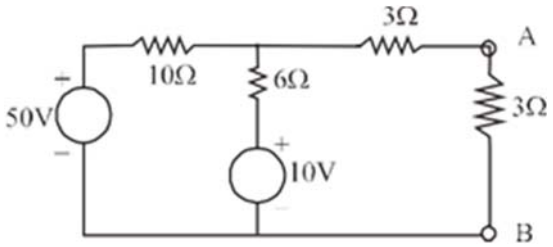
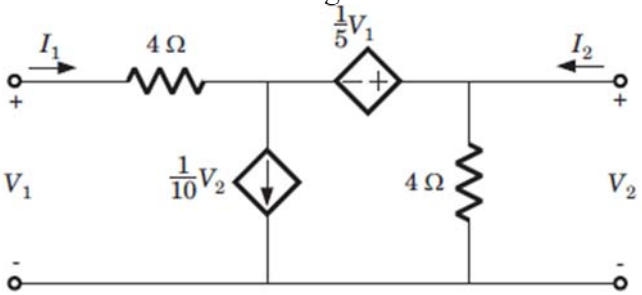
SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a.	State Routh Hurwitz criterion of stability of Network function.
b.	What are the Dependent & Independent terms in the Y- parameter?
c.	How unilateral elements differ from bilateral elements? Explain
d.	What is the significance of convolution theorem?
e.	Differentiate between Network Analysis and Network Synthesis. Name the methods to solve them.
f.	Describe h-parameters of a two-port network.
g.	What are Characteristics of PRF?

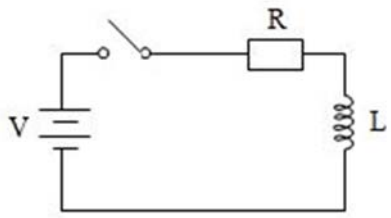
SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a.	Find the current flowing in branch AB using Thevenin theorem. Verify the result by superposition theorem. 
b.	Calculate ABCD Parameter for the given circuit. 
c.	Determine the Laplace transform of $x(t)=e^{-3t}u(t)+e^{-4t}u(t)$. Also locate the poles and zeros in the s-plane.
d.	Realize the following R-L Impedance Function in Cauer-I Form. $Z_{LC}(s) = \frac{(S^2+1)(S^2+3)}{s(S^2+2)}$.
e.	What are general characteristics and descriptions of signals? Explain in detail.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Explain transient response of series RLC circuit with dc input supply.
(b)	A Series R-L Circuit is excited at t=0 by closing a switch as shown in fig. Assuming zero initial conditions, the value of $\mathbf{d^2I/dt^2}$ at $t=0^+$. 

4. Attempt any *one* part of the following: 7 x 1 = 7

(a)	State maximum power transfer theorem and derive the relation to calculate maximum power.
(b)	Using convolution theorem, find inverse LT of $\frac{a}{(s^2 + a^2)^2}$.

5. Attempt any *one* part of the following: 7 x 1 = 7

(a)	What is Routh-Hurwitz Stability? Criterion Test for Hurwitz polynomial using continued fraction expansion method. $P(s)=S^4+7S^3+6S^2+21S+8$
(b)	Explain following terms with reference to network topology: (i) Tree (ii) Co-tree (iii) Incidence matrix (iv) Oriented graph (v) Twig and link

6. Attempt any *one* part of the following: 7 x 1 = 7

(a)	How are filters classified for the network analysis? Briefly describe applications
(b)	Prove that for a Reciprocal network $\mathbf{Y_{12}=Y_{21}}$, where Y_{12} & Y_{21} are Y-parameters.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Write methodology for simple network synthesis. Also explain synthesis of two element type one port network.
(b)	Explain the characteristics of Positive Real Function (PRF).