B TECH
(SEM-III) THEORY EXAMINATION 2019-20
NETWORK ANALYSIS & SYNTHESIS

Time -3 Hour   *Total Marks: 100*

Note: Attempt all Section. If require any missing data: then choose suitably.

SECTION A

1 . Attempt all questions in brief   **2x10= 20**

(a) State Thevenin theorem
  (b) What are the limitations of initial value theorem?
  (c) Write is the properties of RL functions.
  (d) Write applications name of 741IC used in network analysis.
  (e) Write is the necessary and sufficient condition for positive real function
  (f) Define open circuit parameters.
  (g) What do you mean by transfer impedance function?.
  (h) Explain the gate function used in network analysis.
  (i) State about zeros of transmission.
 (j) Check whether the given polynomial $P(s) = s^4+ s^3+4 s^2+2s+3$ is Hurwitz or not.

SECTION B

2.   Attempt any three of the following   **10x3= 30**

  (a) What is mean by complex frequency? Explain all basic standard signal used in network analysis.
  (b) State and explain the different types of network used in network analysis.
  (c) Realize the following RLdriving point impedance function in
          (a) Cauer first form
          (b) Cauer second form
          $Z(s) = (s+4)(s+6)/(s+3)(s+5)$
  (d) Find the nortons equivalent circuit across AB terminal as shown below
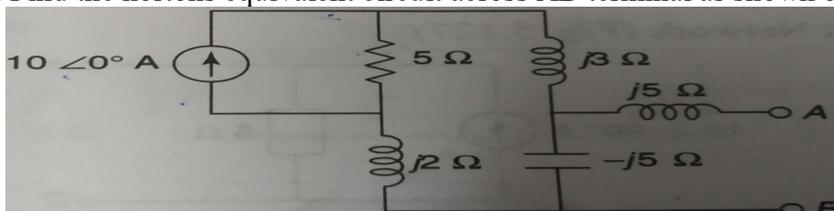
  (e) Prove any two properties of laplace transform and determine inverse laplace transform of the following function using convolution integral $F(s)= F_1(s).F_2(s)= 1/(s+c)(s+b)$.

SECTION C

3.   Attempt any one parts of the following   **10x1=10**

  (a) Calculate the current through j3 branch using Thevenin theorem in fig 2.
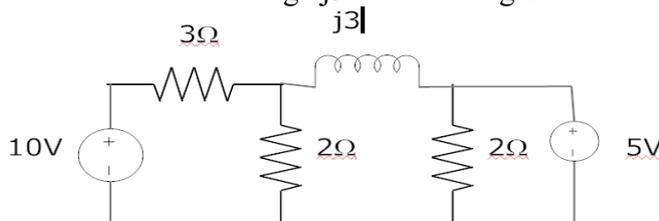

Fig 2

(b)   (i) Explain the Negative Impedance Converter in detail.
       (ii) Prove the Initial value theorem in complex frequency domain.

4.   Attempt any one parts of the following   **10x1=10**

(a) Explain the Series connection using Z parameters and parallel connection
    using y parameters and also prove for overall parameters using two model of
    two port network.

(b) Write the all properties of positive real function and transfer function.

5.   Attempt any one parts of the following   **10x1=10**

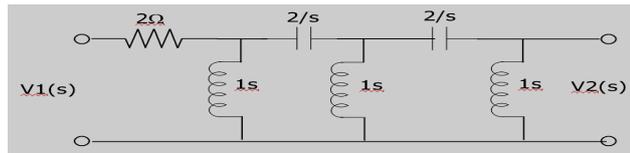 (a) Determine the voltage transfer function $V_2(s) / V_1(s)$ for the network shown in fig 3.

Fig 3

(b) Synthesis the following function using 1 ohms termination
$$Z_{21}(s) = 2 \ / \ (s^3+3s^2+4s+2)$$

6.   Attempt any one parts of the following   **10x1=10**

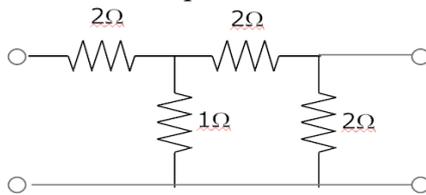 (a) (i) Determine the Z parameters of circuit shown in figure 4.

Fig 4

   (ii)   Convert **y** parameters in terms of ABCD parameters.

(b) (i) What is mean by active filter? Explain them using proper characterstics..
   (ii) Determine whether the function $Z(s)= (4s^2+3s+3)/ (4s^2+4s+16)$ is positive real or
        not.

7.   Attempt any one parts of the following   **10x1=10**

 (a) Using the foster (I) and foster (II) to synthesize the function:

   $$Z(s) = 2(s^2+1)(s^2+9)/s(s^2+4)$$

  (b) Realize the following RL driving point impedance function in
      (i)   Foster II form
      (ii) Cauer first form
      $$Z(s) = (s+1)(s+3)/(s+2)(s+4)$$