## FACULTY OF ENGINEERING
### B.E. (ECE) III-Semester (AICTE) (Backlog) Examination, October 2021

**Subject: Network Theory**

Time: 2 hours                                                    Max. Marks: 70

**Note: Missing data, if any, may be suitably assumed.**

### PART – A

**Answer any five questions.**                          **(5x2 = 10 Marks)**

1.  Explain the reason for using Y-parameters for Parallel - Parallel interconnection of two port networks.
2.  Define short circuit admittance parameters for a two port network.
3.  Define characteristic impedance and propagation constant.
4.  Define Image Transfer Constant, Iterative Transfer Constant of the asymmetrical network
5.  What is a composite filter .What are the functions of each sections used in it.
6.  Define LPF and BPF with its characteristics.
7.  Derive the relation between Neper and Decibels.
8.  Design a symmetrical π attenuator with a R0=600Ω and attenuation of 60 dB.
9.  State the conditions for a polynomial to be Hurwitz.
10. Test Whether the polynomial $P(S) = 2s^3 + 4s^2 + 5s + 2$ is Hurwitz.

### PART – B
**Answer any four questions.**                          **(4x15 = 60 Marks)**

11. a) Define Hybrid parameters of a Two Port network. Establish the relation between Hybrid Parameters and ABCD Parameters.
    b) Find the open circuit impedance parameters for the network shown below
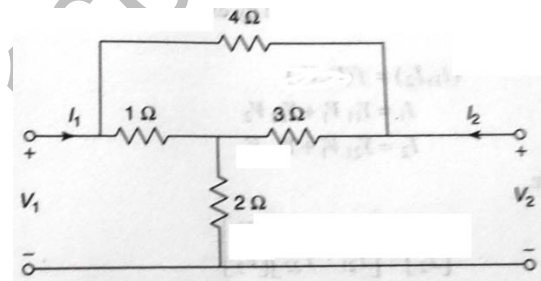


12. a) A symmetrical T-section has an inductance of 0.47H in each series arm and a 300 µ$F$ capacitor in the shunt arm.
       i) Find the characteristic impedance at frequencies of 50 Hz and 100 Hz.
       ii) If the T-section is terminated in the characteristic impedance, find the ratio of load current to input current at both the frequencies.
   b) For T-network series arm impedance are 500Ω, 1000Ω and shunt arm impedance is 1500 Ω. Determine its iterative and image impedances.

13. a) Design a composite low pass filter to the following specifications:
   (i)The termination is a 600ohm resistor.
   (ii)The cut-off frequency is 1000 H$z$.
   (iii)The frequencies of infinite attenuation are $f_{\infty 1}=1050$ Hz
   Draw the  schematic.  Diagram of the filter and compute all element values.

14. a) What is Attenuator? Derive the necessary equations for the design of a
       Symmetrical π  attenuator.
    b) Design an unbalanced asymmetrical π- attenuator with a attenuation of 15
       dB to operate between 400Ω and 625Ω line.

15. a) What is an LC immittance function? State the properties of such functions.
    b) Synthesize the following function using Cauer form I
       $$Z(S) = S\ (S^2 + 3)\ (S^2 + 5)\ /\ (S^2 + 2)\ (S^2 + 4)$$

16. a) Find the Transmission Parameters of the network below
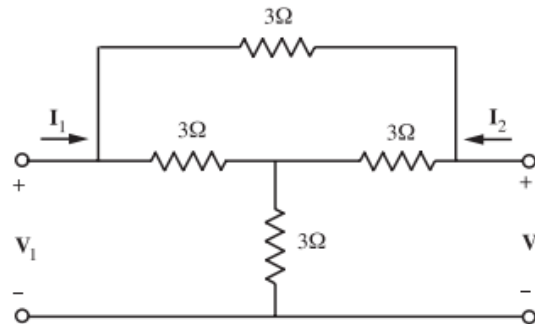


    b)  Obtain the expressions for the image and iterative impedances of an
        asymmetrical T-network.

17. Answer any two of the following
        i) Design a 400Hz active notch filter. Explain in detail with a suitable diagram,
           the  function of notch filter.
        ii)  Design a T pad attenuator to give an attenuation of 20 dB and characteristic
             impedance of 75Ω.
        iii) Determine whether the following function is RC impedance function or not
             $Z (S) = 3(S+2)\ (S+4)\ /\ S\ (S+3)$.
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# FACULTY OF ENGINEERING
### B.E. (I.T) III – Semester (AICTE) (Backlog) Examination, October 2021

#### Subject: Data Structures

**Time: 2 Hours**                                                                 **Max. Marks: 70**
### (Missing data, if any, may be suitably assumed)

## PART – A
**Note: Answer any five questions.**                              **(5x2 = 10 Marks)**

1  Define abstract data types (ADT).
2  Define 'Big Oh Notation'.
3  Differentiate between arrays and linked lists.
4  Convert an infix expression (A/B*C*D+E) into a postfix expression.
5  Compare and contrast DFS and BFS.
6  List the properties of a Binary Search Tree.
7  Define template. List out the advantages of using templates in C++.
8  Define heap with an example.
9  Differentiate Static and Dynamic Hashing techniques.
10 Differentiate internal and external sorting.

## PART – B
**Note: Answer any four questions.**                              **(4x15= 60 Marks)**

11 a) Explain KMP pattern matching algorithm with an example string. Write the
      algorithm for Fast Find.
   b) Explain about sub typing and inheritance in
      C++.
12 Write a C++ code to implement following operations on queue.
   a) Insert       b) Delete        c) Display        d) Rear        e) Front

13 Explain prim's algorithm and find minimum cost spanning tree for the following
   graph.
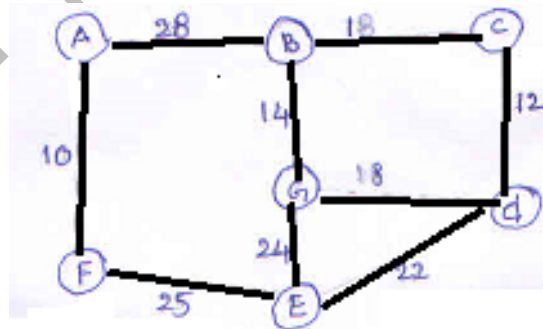


14 a) Write an algorithm to delete an item from Binary Search Tree
      (BST).
   b) Construct a Max heap from the following sequence of integer elements   {120,
      140, 40, 50, 80, 70, 60, 90, 20, 100}

15 a) Explain the working of Counting Sort. Sort the following sequence of keys using
      counting sort. {1, 0, 2, 1, 0, 1, 1, 5, 6, 7, 5, 4, 2, 2, 0, 0,1}
   b) Explain how overflow handling is done in hashing.

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16 a) Write an algorithm to add two polynomials using linked list.

b) Explain about dynamic memory allocation and exception handling in C++.

17 Write short notes on following:
   a) Secure Hash Function
   b) Access Modifier and Constructors in C++.

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