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Name of Examination : **Winter 2020** - (Preview)

Course Code & Course Name : **ET304U - Data Structures**

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Maximum Marks : **60**

Duration : **3 Hrs**

[Edit](#) [Print](#) [View Answer Key](#) [Close](#) **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data; if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks.

1) Solve All Sub Questions

- a) What is data structure? Distinguish between linear and non linear data structure. [4]
- b) What does abstract data type means? Explain it with example. [4]

2) Solve All Sub Questions

- a) How to determine the performance of algorithm. Discuss the various asymptotic notations. [4]
- b) Write an algorithm for binary search and analyze its time complexity. [4]

3) Solve Any Two Sub Questions

- a) How does quick sort works? Sort the following array using quick sort method. [5]
44 33 11 55 77 90 40 60 99 22 88
- b) Write a short note on array of structures. How to show polynomial representation using array of structures> [5]
- c) How selection sort works? [5]

4) Solve Any Two Sub Questions

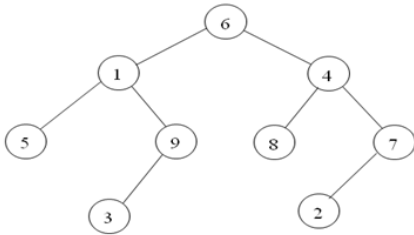
- a) Write the comparison between array and linked list. [5]
- b) Write down the steps to insert a new node in an intermediate position in the linked list. [5]
- c) Explain traverse function for linked list. [5]

5) Solve Any Three Sub Questions

- a) Write the "queue full" source code using array for queue. [4]
- b) Convert the following infix expression to postfix form. Also show status of stack at each step: [4]
 $((A + B) - (C * D)) / (E / (F ^ 2))$
- c) Write a short note on priority queue. Also explain application of queue. [4]
- d) Explain recursion as an application of stack with examples. [4]

6) Solve Any Three Sub Questions

- a) Write the preorder and inorder traversal techniques of the following binary tree. [4]



- b) Define expression tree with suitable example. [4]
- c) Write a source code for insert an element into a binary search tree. [4]
- d) Construct a binary search tree for the following data: [4]
10, 3, 15, 22, 6, 45, 65, 23, 78, 34, 5

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