

Enrollment No: _____

Exam Seat No: _____

C. U. SHAH UNIVERSITY

Winter Examination-2022

Subject Name : Introduction to Algorithms & Data Structure

Subject Code : 4CS04BDS1

Branch: B.C.A.

Semester: 4

Date: 20/09/2022

Time: 02:30 To 05:30

Marks: 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
 - (2) Instructions written on main answer book are strictly to be obeyed.
 - (3) Draw neat diagrams and figures (if necessary) at right places.
 - (4) Assume suitable data if needed.
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Q-1 Attempt the following questions: (14)

- a) An algorithm may have _____ 'inputs' quantities.
A. One or more
B. Zero or more
C. Two or more
D. None of the above
- b) Quick sort algorithm is an example of
A. greedy approach
B. dynamic programming
C. improved binary search
D. Divide and conquer
- c) Which indicates pre-order traversal?
A. Left sub-tree, Right sub-tree and root
B. Right sub-tree, Left sub-tree and root
C. Root, Left sub-tree, Right sub-tree
D. Right sub-tree, root, Left sub-tree
- d) Which of the following case does not exist in complexity theory
A. Best case
B. Average case
C. worst case
D. null case
- e) Travelling salesman problem is an example of
A. Dynamic Algorithm
B. Greedy Algorithm
C. Recursive Approach
D. Divide and Conquer
- f) DFS stands for ____
A. Depth First Sort
B. Defined Following Search
C. Depth First Search
D. Defined First Search
- g) Queue data structure works on
A. LIFO
B. FIFO
C. FILO
D. None of these
- h) The amount of time the computer needs to run to completion is known as _____.
A. Space Complexity
B. Time Complexity
C. Recursive function
D. None of the above
- i) Space complexity of an algorithm is the maximum amount of _____ required by it during execution.
A. Time
C. Memory Space

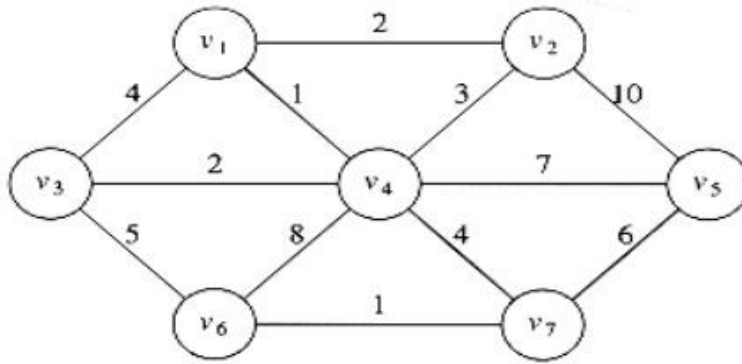


- B. Operations D. None of the above
- j) Which type of traversal of binary search tree outputs the value in sorted order?
 A. pre order C. post order
 B. in order D. None of these
- k) BST stands for ____
 A. Beta Search Tree C. Balanced Search Tree
 B. Binary Search Tree D. Binary Sort Tree
- l) An algorithm is a _____ set of precise instructions for performing computation
 A. finite C. infinite
 B. constant D. None of the above
- m) A binary tree whose left sub tree and right sub tree differ in height by at most 1 unit is called ____
 A. Lemma tree C. red black tree
 B. AVL tree D. none of the above
- n) In _____ search each element is compared with search element till not found
 A. Binary C. Merge
 B. Sequential D. None of the above

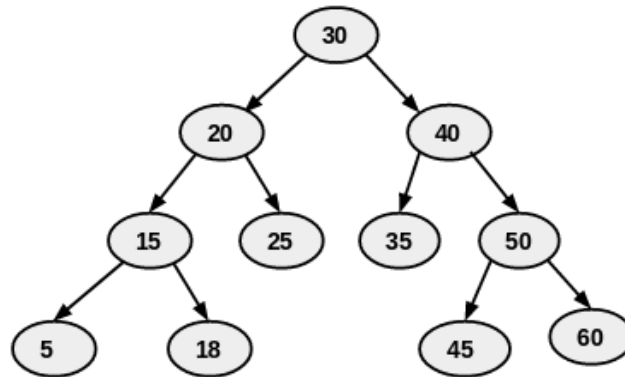
Attempt any four questions from Q-2 to Q-8

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|------------|---|-------------|
| Q-2 | Attempt all questions | (14) |
| A | Explain characteristics of algorithm. | 07 |
| B | Explain control mechanism in algorithm. | 07 |
| | | |
| Q-3 | Attempt all questions | (14) |
| A | Explain algorithms of push, pop, peek operations of stack. | 07 |
| B | What is DEQueue ? Explain its types. | 07 |
| | | |
| Q-4 | Attempt all questions | (14) |
| A | Explain types of functions with diagram | 07 |
| B | Explain asymptotic notation. | 07 |
| | | |
| Q-5 | Attempt all questions | (14) |
| A | Explain graph representation methods with example | 07 |
| B | Explain difference between DFS and BFS. | 07 |
| | | |
| Q-6 | Attempt all questions | (14) |
| A | Explain directed graph, undirected graph, mixed graph with diagram. | 07 |
| B | Explain types of binary tree with example. | 07 |
| | | |
| Q-7 | Attempt all questions | (14) |
| A | Find MST and total weight using Krushkal's algorithm | 07 |





B Write down in order, pre order and post order traversal for the following tree. **07**



Q-8 **Attempt all questions** **(14)**

A What is recursion? Write an algorithm for finding factorial using recursion. **07**

B What is spanning tree? Explain with its properties. **07**

