SP - 66

Total No. of Pages : 3

Seat No.	

S.Y. B.Tech. (E & TC) (Semester - IV) (CBCS)
Examination, December - 2023
DATA STRUCTURE
Sub. Code : 79185

10573

Day and Date : Friday, 29 - 12 - 2023 **Total Marks : 70**
Time : 2.30 p.m. to 5.00 p.m.

Instructions : **1)** **All questions are compulsory.**
2) **Figures to the right indicate full marks.**

Q1) Solve the objective type question : **[14]**

a) The smallest element of an array's index is called its _____

i) lower bound ii) upper bound

iii) range iv) extraction

b) When new data are to be inserted into a data structure, but there is no available space; this situation is usually called _____

i) Housefull ii) Saturated

iii) Underflow iv) Overflow

c) A linear list of elements in which deletion can be done from one end (front) and insertion can take place only at the other end (rear) is known as a _____

i) queue ii) stack

iii) tree iv) linked list

d) Binary tree means that the node can have maximum _____ children

i) 0 ii) 2

iii) n iv) n + 1

P.T.O.

e) In Post order traversing of Tree, Root node is processed _____ Left Sub-Tree and Right Sub-tree

i) before . ii) after

iii) between iv) not mentioned

f) The data structure required to evaluate a postfix expression is _____.

i) queue ii) stack

iii) array iv) linked-list

g) What is a hash table?

i) A structure that maps values to keys

ii) A structure that maps keys to values

iii) A structure used for storage

iv) A structure used to implement stack and queue

Q2) Solve Any two : **[14]**

a) Explain term garbage collection also explain overflow and underflow situations.

b) Explain time-space trade off with example.

c) What is Binary Search method? Write binary Search Algorithm?

Q3) Solve Any two : **[14]**

a) Write an algorithm to Search an element ITEM from array A using linear search method.

b) Write and explain an algorithm to insert a node in Linked List.

c) Explain the bubble sorting algorithm with example.

Q4) Solve Any two : **[14]**

a) Define Stack and explain linked representation of Stack.

b) Write an algorithm to evaluate VALUE of an arithmetic expression P written in postfix notation.

c) Explain Shortest-Path Algorithm with example.

Q5) Solve Any two : **[14]**

a) Write an algorithm to delete a node from binary tree.

b) Represent the following algebraic expression in binary tree structure. E = [a + (b – c)]*[(d – e) / (f + g – h)].

c) Construct a binary tree from the given order.

Post order: HIDEBJFKGCA

In order: HDIBEAFJCGK

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