

S.No. : 120

BAI 3402

No. of Printed Pages : 04

Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 33706

Roll
No.

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B. Tech. Examination 2021-22

(Even Semester)

DATA STRUCTURE USING 'C'

Time : Three Hours]

[Maximum Marks : 60

Note :- Attempt all questions.

SECTION – A

1. Attempt all parts of the following : $8 \times 1 = 8$

- What is data structure and why we use it?
- Define abstract data type.
- Compare time and space complexity.
- If the tower of Hanoi is operated on $n = 10$ disks, calculate the total number of moves.

[P. T. O.

- (e) Write pseudo code for merging two single linked list.
- (f) Write the use of priority queue in computer science.
- (g) What is Sorting? How is sorting essential for data base application?
- (h) When does a graph become tree?

SECTION – B

2. Attempt any two parts of the following : $2 \times 6 = 12$
- (a) What are the various asymptotic notations? Explain the Big Oh notation.
 - (b) Convert it into prefix and postfix expressions :
$$((a + b) + c * (d + e) + f) * (g + h)$$
 - (c) Differentiate between internal and external sorting. Also differentiate between linear search and binary search.
 - (d) What are the different representations of graph in data structure? Explain.

SECTION – C

Note :- Attempt all questions. Attempt any two parts from each questions. 5 × 8 = 40

3. (a) What is linked list? Explain different types of linked list. How to insert a node in the middle of linked list of size-10?
- (b) Write a recursive “C” functions to implement binary search and compare its time complexity.
- (c) Write the algorithm for merge sort.
4. (a) Explain and classify the data structure. Write the different types of operation used in data structure.
- (b) Differentiate between recursion and iteration.
- (c) A very large array of elements is to be sorted. The program is to be run on a personal computer with limited memory. Which sort would be a better choice : Heap sort or quick short? Why?
5. (a) Explain different types of traversing in tree. Find the preorder traversing for given post order and in order traversing :

[P. T. O.]

In Order : D G B A H E I C F

Post Order : G D B H I E F C A

- (b) What is Quick Sort? Sort the given values using quick sort. Show all the steps / iterations :
- 38, 81, 22, 48, 13, 69, 93, 14, 45, 58, 79, 72
- (c) What is Stack? Write the algorithm for PUSH and POP operation.
6. (a) Explain with diagram the functioning of doubly linked list.
- (b) Explain all the collision resolution strategies in hashing.
- (c) Discuss Prim's and Kruskal's algorithm with suitable example.
