

22160

II SEMESTER B.Sc. EXAMINATION, JULY/AUGUST 2023

SCHEME: SEMESTER - NEP

025

COMPUTER SCIENCE

DATA STRUCTURE USING 'C'

Time: 2 ½ Hours

Max Marks: 60

Instruction: Answer Part A & Part B.

PART - A

Answer any Eight questions

2x8=16

1. Mention the different goals of Data Structure. CO1 LL1
2. What is performance analysis? CO1 LL1
3. Give the syntax to declare one dimensional Array. CO1 LL1
4. Define Sorting. CO2 LL1
5. Evaluate the postfix expression using stack: $53 + 2 * 697 - / -$ CO2 LL3
6. Define a Priority Queue. CO2 LL1
7. Differentiate Static and Dynamic memory allocation. CO3 LL1
8. Write the syntax to declare a node in a linked list. CO3 LL1
9. What are the advantages of linked list? CO3 LL1
10. Define a tree. CO4 LL1
11. State the properties of a Binary tree. CO4 LL1
12. List the different Binary tree traversal techniques. CO4 LL1

PART - B

Answer all the questions.

11x4=44

13. a) What is Recursion? Write a recursive algorithm to solve Tower of Hanoi problem. CO1 LL2 5
 - b) Briefly explain the classification of Primitive data structures. CO1 LL2 6
- OR
- c) Explain the basic operations performed on Data Structure. CO1 LL2 5
 - d) Write a note on: CO1 LL2 6
 - i) Best case
 - ii) Average case
 - iii) Worst case Time complexities

PTO

14. a) With an algorithm, explain the various operations performed on stack. CO2 LL2 6
- b) Explain selection sort with an example. CO2 LL2 5
- OR**
- c) Explain Binary search technique with an example. CO2 LL2 5
- d) Write a 'C' program to perform enqueue and dequeue operations on linear queue. CO2 LL2 6
15. a) With an example, explain the following: CO3 LL2 5
- i) Insert a node at the beginning of the linked list.
- ii) Insert a node at the end of the linked list.
- b) Explain the following: CO3 LL2 6
- i) Calloc () ii) Malloc () iii) Realloc ()
- OR**
- c) Explain garbage collection with respect to memory management in detail. CO3 LL2 5
- d) With memory representation, explain different types of linked list. CO3 LL2 6
16. a) With a neat diagram, explain root, leaf, degree, child and sibling of a tree. CO4 LL2 6
- b) Write an algorithm to create a Binary tree. CO4 LL2 5
- OR**
- c) c1) Differentiate Complete binary tree and Binary Search tree. CO4 LL2 3
- c2) Give the array representation of a binary tree. CO4 LL2 2
- d) Construct a binary tree for the following tree traversals: CO4 LL3 6
- Inorder : DGBAECHF
- Postorder: GDBEHFCA