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(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2023–2026 ONLY)

SUBJECT CODE 23 UCT 205

REG.NO.

N.G.M. COLLEGE (AUTONOMOUS): POLLACHI

END-OF-SEMESTER EXAMINATIONS: MAY – 2024

B.Sc. – COMPUTER TECHNOLOGY **MAXIMUM MARKS: 75**

SEMESTER: II **TIME: 3 HOURS**

PART – III

DATA STRUCTURES

SECTION – A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS. (K1)

MULTIPLE CHOICE QUESTIONS.

1. What is a data structure?
   a) A programming language b) A collection of algorithms
   c) A way to store and organize data. d) A type of computer hardware
2. Which of the following statement(s) about stack data structure is/are NOT correct?
   a) Top of the Stack always contain the new node
   b) Stack is the FIFO data structure
   c) Null link is present in the last node at the bottom of the stack
   d) Linked List are used for implementing Stacks
3. In simple chaining, what data structure is appropriate?
   a) Doubly linked list b) Circular linked list
   c) Singly linked list d) Binary trees
4. Which of the following tree data structures is not a balanced binary tree?
   a) Splay tree b) B-tree c) AVL tree d) Red-black tree
5. What is the average case time complexity of binary search using recursion?
   a) O(nlogn) b) O(logn) c) O(n) d) O(n2)

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES. (K2)

6. List any two applications of data structure
7. Define stack
8. List any two applications of linked list
9. Define Graph
10. List basic file operations

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SECTION – B (5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)

11. a) Explain the characteristics of an algorithm.

(OR)

b) Explain the characteristics of Data structure.

12. a) Explain basic operations in a queue.

(OR)

b) Discuss on application of queue**.**

13. a) Explain the Essential Operations on Linked Lists.

(OR)

b) Discuss Linked List applications.

14. a) Explain Preorder Traversal.

(OR)

b) Explain Breadth First Search.

15. a) List down the advantages and disadvantages of sequential file organization.

(OR)

b) Explain linear search.

SECTION – C (5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K4 (Or) K5)

16. a) Explain Array and its operations.

(OR)

b) Explain representation of Arrays in memory and list down advantages and disadvantages of array**.**

17. a) Discuss Stack Operations with diagram.

(OR)

b) Explain Circular queues.

18. a) Explain the functions of Singly Linked Lists.

(OR)

b) Explain the Operators Circular linked list.

19. a) Explain - Representation of Trees with diagram.

(OR)

b) Discuss Different types of graphs.

20. a) Explain the principles of Merge sort.

(OR)

b) Describe Quick sort using on example.