DCCA211

Reg. No. | | | | | | | | |

II Semester B.C.A Degree Examination, June/July - 2025

COMPUTER SCIENCE

Data Structures

(SEP Scheme)

Time : 3 Hours **Maximum Marks : 80**

Instructions to Candidates:

Answer all the Sections.

SECTION - A

I. Answer any Ten of the following questions. Each question carries Two marks. (10×2=20)

1. Define Data Structures.
2. What is abstract data type?
3. What is Time and space complexity?
4. Mention the applications of Sparse Matrices.
5. Write any two built in functions of strings with syntax and example.
6. Mention the operations of linear arrays.
7. What are the characteristics of linked list?
8. Define Recursion.
9. Mention different types of queries.
10. Distinguish between tree and binary Tree.
11. Define graph with an example.
12. What is Hashing?

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SECTION - B

II. Answer any SIX of the following questions. Each question carries Five marks. **(6×5=30)**

13. Explain the classification of Data Structures.
14. Explain best case, average case and Worst case time complexity of an algorithm with an example.
15. Write a program to perform insertion operations on arrays.
16. How binary search works? Explain with an example.
17. Explain garbage collection Process.
18. Convert the expression $(a+(b*c))+(((d+e)+f)+g)$ into postfix expression.
19. Write an algorithm to insert and delete operations on simple queue using arrays.
20. Construct the Binary tree of order five and insert the following values into it.
    78, 87, 32, 47, 68, 99, 25, 50, 8, 12, 55, 5, 9, 10.

SECTION - C

III. Answer any Three of the following questions. Each question carries Ten marks. **(3×10=30)**

21. Write a program to illustrate the working of built-in functions of strings (length, concatenate, string comparison, and copying of strings).
22. a) Write an algorithm of insert a NODE at the beginning of a Singly Linked List. **(5)**
    b) Define circular linked list. Explain the types of circular linked list with an example. **(5)**
23. a) Write an algorithm for push and pop operations on stack using arrays. **(5)**
    b) Explain the types of Dequeues with an example. **(5)**
24. Write an algorithm for In-order, pre-order and Post-order traversal of binary Tree.
25. Consider the graph given below. Starting vertex is 1 traverse the graph by BFS.