

[Total No. of Questions - 9] [Total No. of Printed Pages - 2]
(2124)

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MCA 2nd Semester Examination
Data Structures (C++ & Java) (NS)
MCA-201

Time : 3 Hours

Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C & D below and all the subparts of Section E.

SECTION - A

1. Explain the following concepts—
 - (a) Class and Object
 - (b) Abstraction
 - (c) Encapsulation (4×3=12)
2. Define data structure. Explain the concept of sparse arrays and its implementation through program implemented either in C++ or Java. (12)

SECTION - B

3. Explain the algorithm for implementation of doubly linked list and its various operations. (12)
4. Explain the algorithm for the conversion of infix notation to polish notation. (12)

[P.T.O.]

SECTION - C

5. Explain and compare the complexities of various sorting algorithms. (12)
6. Explain for any one algorithm for finding shortest paths problem. (12)

SECTION - D

7. What do you mean by Hashing? Explain various Linear probing, Quadratic probing and Double Hashing. (12)
8. Explain Linear Search algorithm and calculate its complexity for best, average and worst cases. (12)

SECTION - E

9. (a) Define hash table.
(b) Define time-space tradeoff between algorithms.
(c) What is the difference between graph and tree?
(d) Explain priority queue.
(e) If the preorder traversal of a BST yields the following keys:
15 10 7 5 8 12 25 22 20 23 30
In which order will the keys be traversed in postorder?
(f) Define class and object.
(g) What do you mean by Multiple inheritance?
(h) What is the best, average and worst case complexity for Quicksort?
(i) What is Big O notation?
(j) What is the difference between Sequential and Indexed Sequential file?
(k) What is the difference between BFS and DFS Graph traversal algorithm?
(l) What is Heap Sort? (12×1=12)
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