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**I Semester M.C.A. Degree Examination May/June - 2025****COMPUTER APPLICATIONS****Data Structure****(CBCS Y2K21 Scheme)****Paper : 1MCA6****Time : 3 Hours****Instructions to Candidates :**

Answer All parts.

**Maximum Marks : 70****PART - A****Answer any Five of the following. Each question carries 6 marks. (5×6=30)**

1. What is data structure? Explain the classification of data structure with example.
2. Discuss the string operations with built-in functions in C language
3. What is array? Explain array as ADT.
4. Write an algorithm to insert an element into the QUEUE and delete an element from the QUEUE.
5. Explain different tree traversal algorithms with example.
6. Discuss topological sorting with example.
7. What is hashing? Discuss the collision resolution techniques.
8. Write and explain insertion sort algorithm.

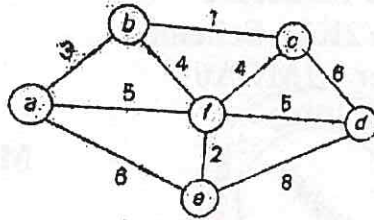
**PART - B****Answer any Four questions. Each question carries 10 marks. (4×10=40)**

9. a) Explain asymptotic notations.  
b) Explain any one pattern matching algorithm. (6+4)
10. a) Write an algorithm to convert infix expression to postfix expression using Stack.  
b) Write a C Program to create a singly linked list and insert an element at the end of the linked list. (5+5)
11. a) Explain different types of queues with example.  
b) Discuss the how linked list is differ from array. (5+5)

**[P.T.O.]**



- 12. a) What is AVL tree? Create AVL tree from the give elements: 45, 23, 67, 89, 91, 65, 35, 40, 12.
- b) Discuss traversal of the following graph using BFS. (6+4)



- 13. a) Explain B tree and mention its applications.
  - b) Write binary search algorithm with its time complexity. (5+5)
- 14. a) Sort the following array using merge sort. 78, 82, 27, 90, 12, 63, 87 58, 43
  - b) Write a short note on divide and conquer technique. (5+5)

