

MCA Bridge Course  
Month's Feb. 25

Date: 4/2/25

Time: 3 Hours

Total Marks: 80

N.B.: 1) Question No.1 is compulsory.

2) Attempt any three from the remaining five questions.

(Winter-2024)

(Second Half-2024)

1. Write Short Notes on :- (20)
  - a) Performance Analysis
  - b) Circular Queue
  - c) Divide and Conquer
  - d) Doubly Linked list
2. (a) Define Hashing. Explain any three hashing techniques in detail. (10)
- (b) Compare Linear Search and Binary Search? Search an element 31 in the list using Binary Search : 10, 14, 19, 26, 27, 31, 33, 25, 42, 44 (10)
3. (a) What is a binary tree? Explain with an example the process to convert a general tree to binary tree. (10)
- (b) What is Bubble sort? Sort the given data using Bubble sort and give the algorithm 23 33 77 13 89 66 (10)
4. (a) What is Analysis of algorithm? Explain the Asymptotic Notations (Big O,  $\Omega$ ,  $\theta$ ) used while analyzing an algorithm. (10)
- (b) Define binary search tree. Write an algorithm to add a node in binary search tree. (10)
5. (a) Define and explain the stack data structure with suitable example. Give algorithms for Push, Pop, Stackempty and Stackfull functions. (10)
- (b) Differentiate between singly and doubly linked lists. Give an algorithm to traverse a singly linked list. (10)
6. (a) What is queue? How you will implement following operation for a queue implemented using linked list – (10)
  1. Insert an element in the queue.
  2. Delete an element from the queue.
- (b) Given the set of symbols and corresponding frequency table as below, explain the steps to find Huffman Code (10)

Symbol	A	B	C	D	E	F	G	H	I
Frequency	15	12	10	8	5	7	6	5	5