

Time: 3 Hours

Total Marks: 80

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

(2) Attempt any THREE Questions between Question No.2 to 6

- Q1 Answer any Four Questions out Five. [20]
- a) Big O Notation
 - b) Dynamic Programming
 - c) Binary Search Technique
 - d) Back Tracking Method
 - e) Huffman Tree
- Q2 (a) What is data structure? Explain the tradeoff between space and time complexity. [10]
- (b) Write an algorithm to implement shell sort method. [10]
- Q3 (a) Define Hashing. Explain any three hashing techniques in detail. [10]
- (b) Define queue. Write an algorithm to perform enqueue and dequeue operations on circular queue. [10]
- Write a note on :
- Q4 (a) i) Quadratic probe [10]
- ii) Key offset collision resolution techniques.
- (b) Explain the advantages of linked list over array and give the algorithm to add a node in doubly linked list. [10]
- Q5 (a) Differentiate between singly and doubly linked lists. Give an algorithm to traverse a singly linked list. [10]
- (b) What is a binary tree? Explain with an example the process to convert a general tree to binary tree. [10]
- Q6 (a) Write an algorithm to implement Insertion sort and apply it on the following series of numbers: 10,27,23,56,38,66,45. Show the numbers after every pass. [10]
- (b) Define binary search tree. Write an algorithm to add a node in binary search tree. [10]
-