

SUMMER-2019

UNIT-1

Q.1 a) Consider the array A: 8, 9, 7, 5, 4, 3, 11. Write an efficient algorithm to find sum of all even numbers in A. (7)

b) Explain the different structures for storing the string. (6)

Q.2 a) Write the slow pattern matching algorithm and obtain an expression for its worst case complexity. (7)

b) What is data structure? What are the types of data structures? (6)

UNIT-2

Q.3 a) Explain binary search algorithm with example in detail. (6)

b) Suppose a three dimensional array AAA is declared using AAA(2:8, -4:1, 6:10) (7)

i. Find the length of each dimension and number of element in array.

ii. Consider element [5, -1, 8] in AAA. Find address of the element. Assuming Base (B) = 400 and w = 4 words/memory location. Elements in array AAA are stored in row major order.

Q.4 a) Write an algorithm which sorts the elements in DATA Linear array along with example. (6)

b) Write an algorithm which inserts an element ITEM into K^{th} position in linear array. Explain with example. (7)

UNIT-3

Q.5 a) Write a procedure which finds location LOC of the last node in a sorted list such that (7)

INFO[LOC] < ITEM or sets LOC = NULL.

b) Text P(x) denote the following polynomial $P(x) = 9x^3 + 7x^2 - 3x + 8$. Give the diagram to represent P(x) by header list. Draw an array representation of this header list. (7)

Q.6 a) Write an algorithm which inserts ITEM so that ITEM follows the node location LOC or inserts ITEM at the first node when LOC = NULL. (7)

b) Write an algorithm for traversing a circular header list. (7)

UNIT-4

Q.7 a) What is queue? Write an algorithm for insertion and deletion from array representation of a queue. (7)

b) Consider the following arithmetic expression P written in postfix notation. (7)

Q.8 a) Explain following (7)

i. Deques

ii. Priority queues

iii. Stack

b) Use quick sort algorithm to find final position of first character D in the following list DATASTRUCTURES. (7)

UNIT-5

Q.9 a) Suppose the following list of letters is inserted in order into an empty binary search tree (7)

J, R, D, G, T, E, M, H, P, A, F, Q

i. Find the final tree T

ii. Find the inorder traversal of T

b) Explain following terms (6)

i. Complete Binary Trees

ii. Extended Binary Trees

Q.10 a) Draw binary tree for the following algebraic expression and give preorder and postorder traversal of the tree. $[a + (b - c)] * [(d - e)/(f + g - h)]$ (7)

b) Suppose PQRSTU VW are 8 data items with a weight of 22, 10, 12, 25, 21, 31, 35, 15 respectively. Apply Huffman's algorithm to construct a tree T with minimum weighted path length. (6)

UNIT-6

Q.11 a) Explain with example Linked List representation of a graph. **(6)**

b) Suppose array A contains 8 elements as follows

77, 33, 44, 11, 88, 22, 66, 55.

Apply insertion sort algorithm to arrange this is in ascending order. Show all passes and result.

Q.12 a) Write an algorithm for depth first search of a graph. **(6)**

b) Apply selection sort to the following array A **(7)**

A: 77, 80, 90, 10, 5, 15