

Printed Pages – 4

Roll No.

333453(22)

B. E. (Fourth Semester) Examination, 2020

(New Scheme)

APR-MAY 2022

(IT Branch)

DATA STRUCTURES and ALGORITHM ANALYSIS

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) from each question is compulsory. Attempt any two parts from (b), (c) and (d) which are of 7 marks each.

Unit-I

1. (a) Explain Asymptotic notation. 2
- (b) What is recurrence relation? Write the different methods of solution of recurrence equations with example? 7

- (c) Define the term Array. How 2-D Arrays are represented in memory? Explain how address of an element is calculated in 2-D array? 7
- (d) Write an Algorithm two add the two polynomial arithmetic equation. 7

Unit-II

- 2. (a) Write the advantages and disadvantages of linked list over array. 2
- (b) Write an algorithm to convert infix expression into postfix. Also convert given infix into postfix 7

$$A*(B-D)/E/F*(G-H/K)$$
- (c) Write an explain algorithm to create a node into doubly linked list from. 7
 - (i) beginning
 - (ii) at mid
 - (iii) at end
- (d) Write short notes on : (any two) 7
 - (i) Garbage collection in linked list

- (ii) Importance of header node in linked list
- (iii) Overflow and underflow condition in Queue

Unit-III

- 3. (a) How do you compare the performance of various searching algorithms? 2
- (b) Sort the following list in ascending order using insertion sort. Also write the complexity. 7

77 33 44 11 88 22 66
- (c) Write an algorithm for binary search and search the item 23 from following list. 7

11 22 30 43 23 44 66 55 60 71 80
- (d) What is Hashing? Explain the various hash function with example. 7

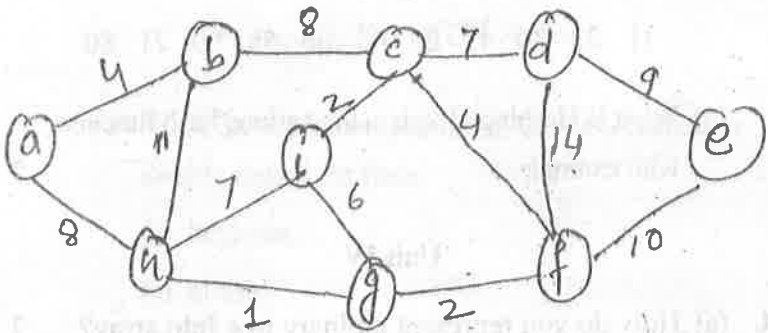
Unit-IV

- 4. (a) How do you represent a binary tree into array? 2
- (b) Draw the binary search tree for the given sequence : 45, 90, 32, 34, 68, 72, 15, 24, 30, 60, 11, 50, 10 and traverse in Preorder, Inorder and Postorder. 7

- (c) Explain Insertion and Deletion operations on AVL search tree. 7
- (d) Explain the term threads. Explain one-way and two way inorder threading with suitable example. 7

Unit-V

- 5. (a) Define sequential representation of Graph. 2
- (b) Explain the BFS Algorithm with suitable examples. 7
- (c) Calculate the minimum cost spanning tree by using prism algorithm. 7



- (d) Write the Warshall's shortest path Algorithm with example. 7