U.G. 2nd Semester Examinations 2022

COMPUTER SCIENCE (Honours)

Paper Code : DC - 3(a)

(Data Structure and Algorithm)

Full Marks : 25 Time : Two Hours

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Group - A

1. Answer any *five* questions : 2×5=10

   (a) Compare a linked list with an array.

   (b) Explain sparse matrix briefly.

   (c) Consider a two-dimensional array Marks[10][15] having its base address as 1000 and the number of bytes per element of the array is 2. Now, compute the address of the element, Marks[10][9], assuming that the elements are stored in column major order.

   (d) Is a doubly linked list more useful than a singly linked list? Justify your answer.

   (e) What is stack overflow?

   (f) What is a priority queue?

   (g) What is min heap?

Group - B

Answer any *three* questions. 5×3=15

2. (a) Construct an AVL tree by inserting the following elements in the given order :

   63, 9, 19, 27, 18, 108, 99, 81

   (b) A hash table of length 7 uses open addressing with hash function h(k)=k mod 7, and linear probing. Insert the following key values in the hash table.

   12, 35, 44, 33, 23 3+2

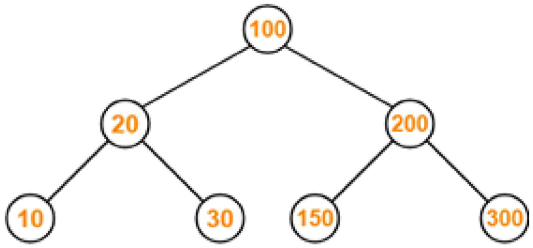
3. (a) Convert the following infix expression into equivalent postfix expression :

(A * B) + (C / D) – (D + E)

(b) Give the linked representation of the following polynomial :

$11x^3y^2 - 6x^2y + 2xy + 22x + 3$ 2½+2½

4. (a) What will be the Preorder and Inorder traversals of the tree given below.



(b) Discuss the complexity of the Bubble sort in brief. 1½×2+2

5. (a) Create a binary search tree with the input given below :

98, 2, 48, 12, 56, 32, 4, 67, 23, 87

(b) Delete values 32, 2, and 56 from the constructed tree. 3+2

6. Write a short note on any *two* : 2½×2

(a) Binary Search

(b) Merge Sort

(c) Circular Queue