K16U 2068

Reg. No. : .....

Name : .....

Third Semester B.C.A. Degree (CBCSS-Reg/Supple./Imp.) Examination, November 2016

General Course

3A12 BCA : DATA STRUCTURE

(2014 Admn. Onwards)

Time : 3 Hours

Max. Marks : 40

SECTION – A

1. Fill in the blanks.

   a) The complexity of binary search algorithm is _____

   b) The number of interchanges required to sort 5, 1, 6, 2, 4 in ascending order using bubble sort is _____

   c) A linear list of elements in which deletion can be done from one end (front) and insertion can take place only at the other end (rear) is known as _____

   d) In the array representation of a sparse matrix, each non-zero element is represented as a triplet with the format _____

   e) Before inserting an element into a stack, one must check the condition _____

   f) _____ is a searching technique which is independent of the number n of elements in the collection S of data.

   g) In a binary expression tree _____ tree traversal produces an infix expression.

   h) The maximum number of nodes on level i of a binary tree is _____

(8×½=4)

SECTION – B

Write short notes on **any seven** of the following questions.

2. What is an Abstract Data Type ?

3. Write the expressions for computing the address of the $(i, j)^{th}$ element of a two dimensional array on row major order and column major order.

P.T.O.

4. What is linear search ? What is the complexity of linear search algorithm ?
5. What is a stack ?
6. Transform the expression (A+B↑ D)/(E–F)+G into postfix form.
7. What is priority queue ?
8. What is recursion ?
9. Define a binary search tree.
10. Write different steps to insert an element into a circular queue.
11. What is the use of head node in a linked list ? **(7×2=14)**

SECTION – C

Answer **any four** of the following questions.

12. Briefly discuss about classification of data structures.
13. Explain how insertion and deletion takes place in a circular queue.
14. Sort the following sequence of keys using Merge sort.

    66, 77, 11, 88, 99, 22, 33, 44, 55
15. Describe any two applications of stack data structure.
16. Write a C++ program to insert a node into a sorted singly linked list.
17. The preorder traversal of a certain binary search tree is {10, 5, 1, 7, 40, 50}. Draw the corresponding binary search tree **(4×3=12)**

SECTION – D

Write an essay on **any two** of the following questions.

18. Write a recursive algorithm for Merge sort and trace the Merge sort algorithm on the list {2, 3, 7, 12, 8, 9, 7, 5, 4}.
19. Explain how addition and deletion operations are implemented in a queue.
20. Write a program to add two polynomials using linked list.
21. Write short notes on :
    a) The notations used for representing the complexity.
    b) Doubly linked list. **(2×5=10)**

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