K15U 0322

Reg. No. : .....

Name : .....

Third Semester B.C.A. Degree (CCSS – 2014 Admn. – Regular) Examination, November 2015

General Course

3A12BCA : DATA STRUCTURE

Time : 3 Hours Max. Marks : 40

SECTION – A

1. **One** word answer :
   a) The Big-O notation provides asymptotic _____ bound for a given function.
   b) The number of elements of an array A [1 : n] is determined by _____
   c) Data elements should be sorted before performing _____ search.
   d) The complexity of Merge sort algorithm is _____
   e) The postfix expression for *+ab – cd is _____
   f) The data structure where elements can be added or removed at either end but not in the middle is called _____
   g) A linked list is considered as an example of _____ type memory allocation.
   h) In a binary expression tree _____ tree traversal produces the postfix expression. **(8×½=4)**

SECTION – B

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

2. Define data structure.
3. Define the term 'Complexity' of an algorithm.
4. How do you represent a stack in computer's memory using a one dimensional array ?
5. What is a sparse matrix ?
6. Transform the expression –/*A + BCDE into infix form.
7. What is dequeue ?

P.T.O.

8. What is garbage collection ?
9. Define a binary tree.
10. Write different steps to insert a node at the beginning of a singly linked list.
11. What you mean by traversing a binary tree ? **(7×2=14)**

SECTION – C

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

12. Write an algorithm to find the transpose of a Sparse matrix.
13. Explain about the application of stacks in implementing recursive function calls.
14. What are the advantages and disadvantages of doubly linked list over singly linked lists ?
15. Write an algorithm to perform selection sort.
16. The order of nodes of a binary tree in preorder and postorder traversals are given under :

    Preorder : {1, 2, 4, 8, 9, 5, 3, 6, 7}

    Postorder : {8, 9, 4, 5, 2, 6, 7, 3, 1}

    Construct the corresponding binary tree.
17. Discuss about different Binary tree representations in memory. **(4×3=12)**

SECTION – D

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

18. Convert the given Infix expression to Postfix form using stack and show the details of stack at each step of conversion.

    Expression : (a + b * c ^ d) * (e + f/g). Note : ^ indicates exponent operator.
19. Write a C++ program to add two polynomials
20. Write an algorithm to insert an element into a circular queue.
21. Write a program using C++ to merge two singly linked lists. **(2×5=10)**
