Reg. No. | | | | | | | | | |

BCACAC 210

Credit Based III Semester B.C.A. Degree Examination, October/November 2014 (New Syllabus) (2013-2014 Batch Onwards) DATA STRUCTURES

Time : 3 Hours Max. Marks : 80

Note : *Answer* ***any ten*** *questions from Part –* ***A, any one full*** *question from* ***each*** *unit of Part –* ***B.***

PART – A

1. a) What is Datastructure ? List the different types. **(2×10=20)**

   b) What are the disadvantages of a queue over circular queue ?

   c) What are the formula for calculation of one dimensional array ?

   d) What is Sorting ? Why it is necessary ?

   e) Differentiate between iteration method and recursion.

   f) Define path and leaf node in a tree.

   g) Write steps in pre-order traversal of a binary tree.

   h) What is a binary tree ? Give an example.

   i) Define complete and labelled graph.

   j) What is digraph ? Give an example.

   k) Mention any two applications of a stack.

   l) Differentiate between linear search and binary search.

PART – B

UNIT – I

2. a) Write a note on strings as ADT.
   b) What is meant by algorithm ? Write an algorithm to find largest element among 'n' element.
   c) What is Linear Array ? Write algorithm for traversing Linear Arrays. **(4+6+5)**

3. a) Briefly explain any 5 data structure operations performed.
   b) Write a note on sub algorithm with an example.
   c) Write an algorithm for searching a number using Binary Search. **(5+5+5)**

UNIT – II

4. a) Write an algorithm to insert a node after a given node in a linked list.
   b) Explain Selection sort method with an example.
   c) Write an algorithm for searching an element from an singly linked list. **(5+5+5)**

5. a) What is a linked list ? Write an algorithm to traverse singly linked list.
   b) Write an algorithm for deleting a node from a singly linked list.
   c) Explain merge sort technique to sort an array of n numbers. **(5+5+5)**

UNIT – III

6. a) Write an algorithm to evaluate postfix expression. Explain with an example.
   b) What is stack ? Explain the operations performed on a stack.
   c) What are priority queues and deques ? Explain. **(5+5+5)**

7. a) What is recursion ? Explain the algorithm to find factorial of a number using recursion.
   b) What is a queue ? Explain the operations performed on a queue.
   c) Convert the following infix expressions into its equivalent Postfix expressions :
      i) (A + B – D) / (E – F) + G
      ii) (A – B) * (D / E). **(5+6+4)**

UNIT – IV

8. a) Explain the following terms in a Binary tree of level 4 :
   i) node
   ii) degree of a node
   iii) siblings
   iv) path
   b) The following are traversals of a binary tree. Draw the corresponding tree
   Preorder : GDHBEIAFCJ
   Inorder : ABDGHEICFJ.
   c) Explain Depth First Search algorithm for a graph with an example. **(6+4+5)**

9. a) Write the algorithm for pre order traversal of a Binary tree with an example.
   b) What is meant by graph ? Explain linked list representation of graph.
   c) Write the procedure for searching and inserting in a Binary search tree.
   (5+5+5)
