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

BCACAC 210

Credit Based III Semester B.C.A. Degree Examination, November/December 2015 (New Syllabus) (2013-14 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) Define Linear and non-linear data structures. **(2×10=20)**

   b) Write any two algorithmic notations with an example.

   c) Give the formulae to find the address of a particular location in a one dimensional array.

   d) What is a circular linked list ? Give diagrammatic representation.

   e) What is a queue ? Why queue is called FIFO list ?

   f) Define dequeue. What are its types ?

   g) Evaluate AB+CD*/ with proper steps. Assume A = 2, B = 3, C = 5, D = – 5.

   h) What do you mean by dynamic memory allocation ?

   i) What is sorting and searching ?

   j) Define binary tree.

   k) Draw a complete binary tree.

   l) Define path matrix.

P.T.O.

PART – B

UNIT – I

2. a) Given a two dimensional array A [10] [20], base address of A being 1000 and width of each element is 4 bytes, find the location of A[8] [15] when the array is stored as (i) column wise (ii) row wise.

   b) Write and explain an algorithm to search a number in using sequential search method.

   c) How do you represent polynomial using an array ? Explain with an example. **(5+5+5)**

3. a) Write bubble sort algorithm. Explain with an example.

   b) List any four operations performed on linear data structures. Describe each.

   c) Compare sequential and binary search techniques. **(7+6+2)**

UNIT – II

4. a) Trace the following numbers using insertion sort : 70, 11, 33, 77, 88, 22, 90, 66.

   b) Write an algorithm to insert a node in a doubly linked list with a neat diagram.

   c) Write an algorithm to search a number using binary search. **(4+4+7)**

5. a) Explain with a figure to delete a node from doubly linked list.

   b) Write an algorithm to insert a node at the beginning in a linked list.

   c) Explain the radix sort technique with an example. **(5+4+6)**

UNIT – III

6. a) Write the algorithm to implement stack operations using an array.

   b) Write an algorithm to convert a infix to postfix expression.

   c) Write a note on priority queue. **(5+6+4)**

7. a) Use algorithm to evaluate the following postfix expression using a stack.

   50 40 + 18 14 – 4 * +

   b) What is recursive procedure ? Write an algorithm to find factorial of a number using recursion ?

   c) Write an algorithm to delete an element from a queue implemented using linked list. (5+5+5)

UNIT – IV

8. a) What are the 3 standard ways of traversing a tree T with root R ? Write steps of each traversal using recursion.

   b) Explain the linked list representation of a binary tree with an example.

   c) Explain linked representation of the graph with an example. (6+4+5)

9. a) Draw the binary search tree for the following list of numbers and traverse it in preorder, inorder and postorder : 14,15, 4, 9, 7, 18, 40, 45, 76, 13.

   b) Trace the graph given above to reach J from node A, using DFS algorithm. (8+7)