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

BCACAC 210

Credit Based Third Semester B.C.A. Degree Examination, Oct./Nov. 2013
(New Syllabus) (2013-14 Batch)
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 **(2×10=20)**

1. a) What is a string ? What is a string concatenation operator ?
   b) Find i) int(3.14) ii) [3.14] = ?
   c) What are the disadvantages of a queue over circular queue ?
   d) What are the formula for column major order and row major order in case of a two dimensional array ?
   e) What is a sparse matrix ? Name the two types of sparse matrices.
   f) List any two recursive sorting techniques.
   g) Define path and leaf node in a tree.
   h) Write the steps in postorder traversal of a binary tree ?
   i) What is a binary search tree ? Give an example.
   j) Define complete and labelled graph.
   k) What is searching ? Name two searching techniques.
   l) Mention any 2 applications of a queue.

PART – B

UNIT – I

2. a) What is data structure ? Briefly explain data structures operations.
   b) Write a note on sub algorithms with an example.
   c) Explain the algorithmic notations for looping statements. **(4+5+6)**

3. a) Write a note on strings as ADT.

   b) Write an algorithm for traversing linear arrays.

   c) Write an algorithm for binary search technique. And also write limitations of binary search. **(5+4+6)**

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UNIT – II

4. a) Write an algorithm to insert a node between two adjacent nodes of a doubly linked list.

   b) Sort the following numbers using shell sort method

   16 4 3 13 5 6 8 9 10 11 12 17 15 18 19 7 2 14 20

   c) Write an algorithm to insert a node at the beginning of a singly linked list. **(4+8+3)**

5. a) Sort the following numbers using merge sort method

   11 2 12 8 6 7 4 3 90 55 44

   b) Write an algorithm to delete a node following the given node of a singly linked list.

   c) What is a linked list ? Explain different types of linked list with neat diagrams. **(6+3+6)**

UNIT – III

6. a) Write the algorithm for inserting and deleting elements to/from a circular queue.

   b) Evaluate the following

      a) 23 * 4 – 5 +

      b) 234 + * 5 –

   c) What is a stack ? Explain the operations performed on a stack. **(6+5+4)**

7. a) Write the algorithms to implement stack using linked list.

   b) What is a queue ? Explain the operations performed on a queue.

   c) Write an algorithm to convert infix expressions to postfix expressions. **(6+4+5)**

UNIT – IV

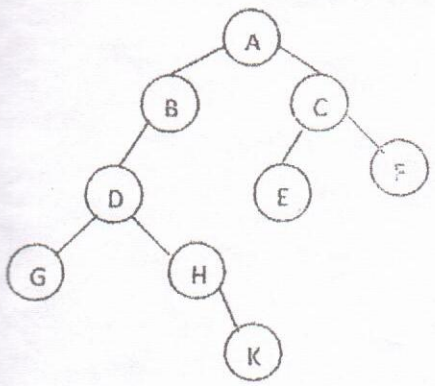
8. a) Write the preorder traversal algorithm of a binary tree using stack.

   b) Explain two standard ways of maintaining a graph in memory.

   c) Write an algorithm to search a node in a binary search tree. **(6+5+4)**

9. a) Write an algorithm to insert a node to the binary search tree.

   b) Give the preorder traversal of a binary tree



   c) Write breadth first search traversal algorithm for a graph with an example.
(5+4+6)
