

Reg. No.

--	--	--	--	--	--	--	--	--	--

BCACAC 210

Credit Based Third Semester B.C.A. Degree Examination, Oct./Nov. 2017
(Common to all Batches)
DATA STRUCTURES

Time : 3 Hours

Max. Marks : 80

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

PART – A

1. a) Define linear data structure and non linear data structure. (10×2=20)
b) What is sparse matrix ? Give example.
c) Write the value of $[-7.2]$ and $[7.5]$.
d) What do you mean by traversing a linear array ?
e) Give two advantages of linked list over an array.
f) What is doubly linked list ? Draw the diagram of doubly linked list.
g) What is stack ? Write any two applications of stack.
h) Define dequeue and what are its types.
i) Differentiate queue and circular queue.
j) What is a binary tree ? Give an example.
k) Define path matrix.
l) Represent $(A+B)/((D/(E*F)))$ using binary tree.

PART – B

Unit – I

2. a) Briefly explain any five data structure operations.
b) Write an algorithm to find a number using binary search.
c) Explain with an example how to represent polynomial using an array. (5+5+5)

P.T.O.



3. a) Explain the algorithmic notations for looping structure.
b) Write and explain algorithm to search an element using linear search.
c) Write a note on strings as ADT.

(5+5+5)

Unit – II

4. a) Write an algorithm to insert a node at the beginning of a linked list.
b) Explain with an example to sort the number using selection sort method.
c) Explain with a figure to delete a node from doubly linked list.
5. a) Sort the following numbers using insertion sort method
70, 11, 33, 77, 88, 22, 90, 66
b) Write an algorithm to search for a given element in a singly linked list.
c) What is linked list ? Explain different types of linked list with a neat diagram.

(5+5+5)

(5+5+5)

Unit – III

6. a) Write an algorithm to convert infix expression to postfix.
b) Write an algorithm to perform PUSH and POP operation on stack using linked list.
c) Write a note on
i) circular queue
ii) priority queue.
7. a) Write an algorithm to perform insert and delete operations on queue using arrays.
b) Evaluate the following postfix expression.
i) 50, 40, +, 18, 14, -, 2, ↑, +
ii) 3, 1, +, 2, ↑, 7, 4, -, 2, *, +, 5, -.
- c) Write an algorithm to find the factorial of a number using recursion.

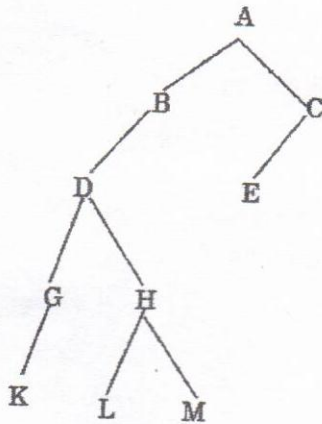
(6+5+4)

(6+5+4)



Unit - IV

8. a) Explain the following terms with respect to binary tree with example :
- i) Degree of node
 - ii) path
 - iii) siblings
 - iv) leaf node.
- b) Draw a binary search tree for the following list of numbers and traverse it in preorder, postorder and inorder : 40, 60, 50, 33, 55, 11, 22, 77, 99.
- c) Define graph. Explain linked representation of graph with example. (5+5+5)
9. a) Write a depth first search traversal algorithm for a graph.
- b) Write an algorithm to search a node in binary search tree.
- c) Consider the following binary tree and traverse preorder traversal algorithm showing the contents of the stack.



(5+5+5)