



PG – 385

II Semester M.C.A. Examination, July 2017
(CBCS)
COMPUTER SCIENCE
MCA – 201T : Data Structures

Time : 3 Hours

Max. Marks : 70

- Instructions :** 1) Part – A : Answer any five questions. (5×6=30)
2) Part – B : Answer any four questions. (4×10=40)

PART – A

A. Answer any five. Each question carries six marks. (6×5=30)

- 1) a) Why do we need data structures ? Mention data structure classification.
b) What is the best time and worst time complexity of linear search ?
- 2) Insert {7, 3, 2, 4, 6, 0} into a linear queue of size 4.
- 3) Differentiate between Depth First Search (DFS) and Breadth First Search (BFS) with an example.
- 4) What is polish expression ? Convert the following infix expression into postfix expression :
$$f(g + (a + b/c))^*e + d$$
- 5) Write a code for concatenating two strings without using inbuilt function.
- 6) Write an algorithm for selection sort with its time complexity.
- 7) What are applications of the following data structures ?
 - a) Stack
 - b) Linked list.
- 8) a) What is typedef and why do we use ?
b) Write a recursive algorithm to solve tower of Hanoi with 3 discs.

P.T.O.



PART – B

B. Answer any four. Each question carries ten marks. (4×10=40)

- 9) a) Brief on the concept of time and space complexity.
b) Write a program to convert infix to postfix expression.
 - 10) a) Why is binary search better than linear search ? Explain binary search technique with the help of an algorithm.
b) What is abstract data type ?
 - 11) Explain stack and queue operation in detail. Write algorithms for the same.
 - 12) Explain the concept of singly linked list by creating node, inserting node and displaying nodes with the help of programming.
 - 13) With necessary algorithm, sort the following using merge sort :
{42, 23, 74, 11, 65, 57, 94, 36, 99, 87, 70}
 - 14) Write short notes on :
 - a) Binary search tree insertion and deletion operation.
 - b) Define : Binary tree, complete graph and directed graph.
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