Question Paper

MANIPAL UNIVERSITY

SCHOOL OF INFORMATION SCIENCES (SOIS)
SECOND SEMESTER MASTER OF SCIENCE- M.Sc (Information Science)
DEGREE EXAMINATION - APRIL 2017
Monday,24,2017
Time :10:00AM- 1:00PM

Data Structures and Algorithms [MIS 502]

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1) Write the data structures required to implement single linked list. Write functions to add an element at the head position and search the given element in the list. (4+3+3) (10)

2) Write the data structures required to implement array based stack. Write functions to create a new stack, push elements into stack and peek from stack. (3+2+3+2) (10)

3) Define queue data structure. List any four applications of queue. Write functions to add and delete elements from linked list based queue. (2+2+3+3) (10)

4) A. Write a function to insert an element in a binary search tree. (6)
B. Write a function to search an element in a binary search tree. (4) (10)

5) Implement Selection sort and Bubble sort. Discuss its time complexity. (4+4+1+1) (10)

6) What is hashing? What is collision in hashing? How do you overcome collision in hashing? Show with example. (2+2+4+2) (10)

7) Write a function for building adjacency list of a Graph. Implement DFS and display elements. (6+4) (10)

8)	Discussing the conditions for attack, write N-Queenâ€™s algorithm using backtracking technique. (4+6)	(10)
9)	Write a program to merge two linked list.	(10)
10)	Given the root node of binary search tree, write functions to A. Find number of leaf nodes. B. Total number of nodes in the tree. C. Display all the values of the nodes. (4+3+3)	(10)