Question Paper

MANIPAL UNIVERSITY

SCHOOL OF INFORMATION SCIENCES (SOIS)
FIRST SEMESTER MASTER OF ENGINEERING - ME (EMBEDDED SYSTEMS/ AUTOMOTIVE EMBEDDED SYSTEMS/ EMBEDDED AND WIRELESS TECHNOLOGY/ COMPUTING TECHNOLOGIES AND VIRTUALIZATION)
DEGREE EXAMINATION - APRIL 2017
Thursday, 20,2017
Time :10:00AM- 1:00PM

Data Structures and Algorithms [ESD 601]

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 count the number of elements in the list. (4+4+2 marks)	(10)
2)	Write the data structures required to implement array based stack. Write functions to check whether stack is full, stack is empty and delete element from stack. (3+2+2+3 marks)	(10)
3)	Give the data structure required for array based queue. Write functions to create a queue, add and delete element from circular queue. (2+2+3+3 marks)	(10)
4)	With required data structure write function to add element into Binary Search Tree. Write a function for In-Order traversal of a binary search tree. (3+5+2 marks)	(10)
5)	Implement insertion sort. Give an example. Discuss its time complexity. (5+3+2 marks)	(10)
6)	Provide different techniques for representing graph. Describe Primâ€™s algorithm with example. (4+4+2 marks)	(10)
7)	What is hashing? With required data structure,	(10)

write function to add an element into Hash table using separate chain hashing (open hashing). (2+3+5 marks)

8) Discussing the conditions for attack, write N-Queenâ€™s algorithm using backtracking technique. (3+7 marks) (10)

9) Using divide and conquer technique, write algorithm to find maximum and minimum elements from a given list. (10 marks) (10)

10) Write functions to (10)

A. Extract element from Maximum heap. (5 marks)

B. Insert element into Maximum heap. (5 marks)