Question Paper



MANIPAL UNIVERSITY

SCHOOL OF INFORMATION SCIENCES SECOND SEMESTER MSc- INFORMATION SCIENCE DEGREE MAKE-UP EXAMINATION- JULY

Monday, July 10, 2017

Time: 10:00 to 13:00

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 delete Head node and tail node and count number of nodes in the single linked list. (3+5+2)	10)
2)	Define stack data structure. Write functions to (add and delete elements from linked list based stack.	10)
	(2+4+4)	
3)	Write the data structures required to (implement array based queue. Write functions to add and delete elements from queue and check whether Queue if Full (4+3+3)	10)
4)	What are the properties of Binary Search Tree? (Provide the data structure required to implement binary search tree. Write a function for delete element from binary search tree.	10)
	(2+2+6)	
5)	Implement Quick Sort. Derive its time (complexity, Give an example,	10)

(10)
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	What is hashing? Write data structures required to implement separate chain hashing (open hashing) technique. Provide functions to insert element in hash table with unique values. $(2+2+3+3)$	
7)	Define minimum spanning tree. Describe Prim's algorithm for finding the minimum spanning tree. Illustrate with an example. (2+6+2)	(10)
8)	With required data structure implement Adjacency list. (10)	(10)
9)	Clearly mentioning the required conditions, write the sum of sub set algorithm using backtracking technique.	(10)
	(3+7)	
10)	Consider two linked list A and B in sorted order. Merge two list into Linked list C which will be in sorted Order.	(10)
	. (10)	