Question Paper

Marks: 100

Exam Date & Time: 20-Nov-2018 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

SCHOOL OF INFORMATION SCIENCES

FIRST SEMESTER MASTER OF ENGINEERING - ME (MEDICAL SOFTWARE / EMBEDEED SYSTEMS / EMBEDDED SYSTEMS AND INSTRUMENTATION / EMBEDDED AND WIRELESS TECHNOLOGY / COMPUTING TECHNOLOGIES AND VIRTUALIZATION / CLOUD COMPUTING / INTERNET OF THINGS)

Data Structures and Algorithms [EWT 601]

Duration: 180 mins.

END SEMESTER DEGREE EXAMINATION NOVEMBER 2018

Answer all the questions.

1) i) Define (a) An Algorithm (b) Data Structures. (10)(ii) Write the required structure and a function to add an item into a singly linked list. (4+6)2) Define stack data structure. List any four applications of (10)stack. Write functions to push and pop elements from linked list based stack. (2+2+3+3)(10)3) Explain what is a circular queue? Write the algorithm to add an item and delete an item associated with this (2+4+4)implementation. 4) For the given list 50, 70, 35, 45, 36, 40, 75, 80, 28, 65, 20 (10)build BST and provide the in-order, pre-order and postorder traversals. (4+6)5) . Implement Merge Sort, discuss its time complexity and (10)illustrate with an example. (6+2+2)(10)6) What is hashing? Write data structures required to implement separate chain hashing (open hashing) technique. Provide functions to implement hashing, check whether element is present in the hash table. (2+3+2+3)7) Define minimum spanning tree. Describe Kruskal's (10)algorithm for finding the minimum spanning tree. Illustrate with an example. (2+4+4)

8)	Let $w = \{5,7,10,12,15,18\}$ and $m = 30$. Find all possible	(10)
----	--	------

	subsets of w that sum to m using back tracking. Draw the portion of the state space tree generated. (10)	
9)	Write the following algorithms a) All pairs shortest path b) Knapsack problem (5+5)	(10)
10)	Consider Graph G with 8 vertex. Traverse the graph with BFS and DFS. Find minimum spanning tree for the Graph G using prims algorithm. $(3+3+6)$	(10)

-----End-----