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#### JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD MCA II Semester Examinations, December - 2019 DATA STRUCTURES AND ALGORITHMS

### **Time: 3 Hours**

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 8 marks and may have a, b, c as sub questions.

# PART - A

# $5 \times 4$ marks = 20

E 4 3

1.a)	Define a single linked list, write the structure of the linked list with neat sketch.	[4]
D)	Explain the representations of graphs.	[4]
c) d)	Insert 02.26 00.06 14.27.28 into PST	[4] [4]
(u)	What is dynamic programming? When to apply it	[4] [4]
<i>e)</i>	what is dynamic programming? when to appry it.	[4]
	PART - B	
	$5 \times 8$ mark	s = 40
2.	Explain the Operations on Doubly Linked Lists.	[8]
	OR	
3.a)	List and explain the applications of stack ADT.	
b)	Write an algorithm to find the sum of n-numbers and also analyze its time comple	xity.
		[4+4]
	NO.	
4.	Differentiate between BFS and DFS traversals. Take an example graph and imple	ment
	the BFS traversal.	[8]
5.a)	Define tree and what are the properties of trees?	Г <i>4 - 4</i> 1
D)	Explain the different types tree traversals.	[4+4]
6 a)	Explain the worst asso time complexity in the quick sort	
(0.a)	Explain the different types of Hash functions are used in bashing	[/ + /]
0)	OR	[474]
7	Perform heap sort algorithm for $(10, 15, 6, 2, 25, 18, 16, 2, 20, 4)$	[8]
/.	1 chomineup soit argonann for (10 15 0 2 25 10 10 2 20 4).	[0]
8.	Define AVL trees. Explain the rotations involved in balancing an unbalanced AV	L tree.
		[8]
OR		
9.a)	Write the insertion algorithm of red-black tree. Also analyze its time complexity	[8]
b)	What are properties of B-Tree.	
10.	Compare the Standard Tries and Compressed Tries with an example.	[8]
	OR	
11.	State and explain the Knuth-Morris-Pratt algorithm with an example.	[8]

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Max. Marks: 60