Q. Code:855943

Reg. No. | | | | | | | | | | | | | |

B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2024

Third-Semester

CS18301 – DATA STRUCTURES

(Computer Science and Engineering)

(Regulation 2018/2018A)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	The students will be familiar with sorting and searching algorithms and appraise its applications	**2**
CO 2	The students will be to use list ADT for a variety of applications and classify them	**3**
CO 3	The students earn a thorough knowledge in Stack and Queue ADT and will appraise the applications in various real time scenarios	**3**
CO 4	The students distinguish linear and non-linear data structures, and appraise the use of Tree ADT.	**3**
CO 5	The students appraise the usage of graph algorithms for various applications	**4**

PART- A (10 x 2 = 20 Marks)

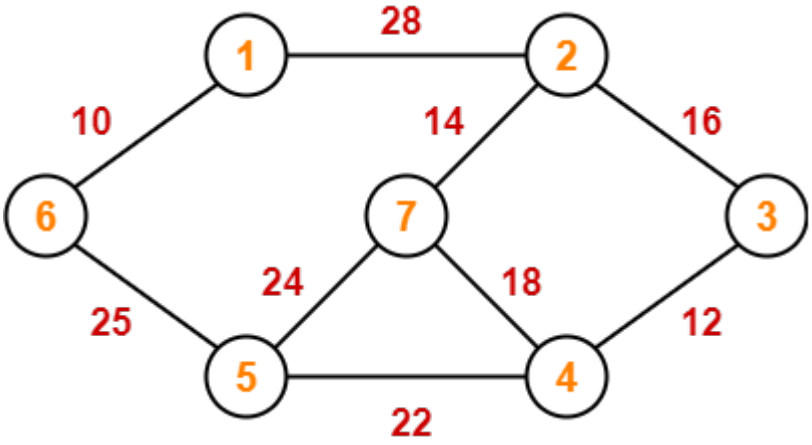
(Answer all Questions)

		CO	RBT LEVEL
1.	Define ADT.	**1**	**1**
2.	Differentiate Linear Search with Binary Search.	**1**	**2**
3.	Enlist the different types of Linked list.	**2**	**2**
4.	Distinguish Doubly and Circularly linked list.	**2**	**2**
5.	Outline the operations performed in Stack and Queue.	**3**	**2**
6.	State the various applications of Stack.	**3**	**2**
7.	Construct a Binary Search tree: 50,10,25,5,40.	**4**	**3**
8.	Draw binary tree for the expression E=(a-b)/((c*d)+e)	**4**	**2**

9.	Distinguish Acyclic with Cyclic graph.	**5**	**3**	
10.	Categorize the graphical representation in graphs.	**5**	**3**	

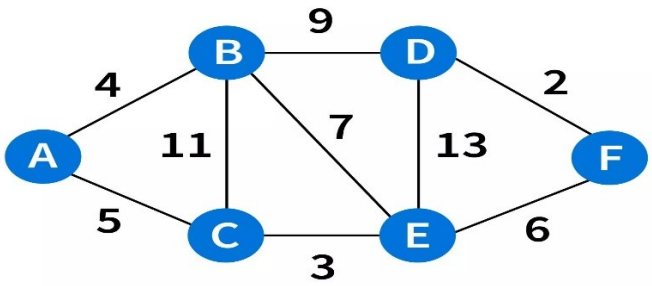
PART- B (5 x 14 = 70 Marks)

		Marks	CO	RBT LEVEL
11. (a)	Write an algorithm to implement insertion sort for the following elements 20,10,60,40,30,15.	**(14)**	**1**	**1**
	(OR)			
(b)	Demonstrate an algorithm to implement Radix sort for the following elements 25,256,80,10,8,15,174,187	**(14)**	**1**	**1**
12. (a)	Create a singly linked list and perform the below listed operations. Also provide the pseudo codes (i) Insert a new node in the middle and end positions of a list. (ii) Delete a node from the beginning of the list	**(14)**	**2**	**3**
	(OR)			
(b)	Explain in detail about the Doubly linked list implementation and write routines.	**(14)**	**2**	**3**
13. (a)	Elaborate in detail about the Operations of Stack with suitable routines.	**(14)**	**3**	**3**
	(OR)			
(b)	How the infix expression is converted into postfix expression using stack for the following expression? A * B + (C –D / E)	**(14)**	**3**	**3**
14. (a)	Describe in detail about AVL tree Single and Double rotation with suitable routines .	**(14)**	**4**	**4**
	(OR)			
(b)	Construct a Splay tree for the following values 8,17,1,14,16,15	**(14)**	**4**	**4**
15. (a)	Create a Minimum spanning tree for the following graph for Kruskal's algorithm	**(14)**	**5**	**4**



(OR)

(b)	Apply the Dijkstra algorithm on the given graph to find the shortest path between A and F	**(14)**	**5**	**3**



PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16.	Construct a Binary search tree for the following example 9,5,11,15,20,18,3: How to insert and delete an element into a binary search tree and write down the code for the insertion routine.	**(10)**	**4**	**5**

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