PUNE INSTITUTE OF COMPUTER TECHNOLOGY

INFORMATION TECHNOLOGY

ACADEMIC YEAR -2020_21

SUB: DSA 2019 course   Semester – I

DSFL ASSIGMENT NO 7 WRITUP OUTLINE

1	**Title**	Assignment 7: Minimum Spanning tree
2.	**Aim**	To implement minimum spanning tree using prims and Kruskals algorithm

3.	**Problem statement**	Represent a graph of your college campus using adjacency list /adjacency matrix.
		 Nodes should represent the various departments/institutes and links should represent the distance between them. Find minimum spanning tree using
		    a) Using Kruskal's algorithm.
		    b) Using Prim's algorithm.
		Analyze above two algorithms for space and time complexity.

4.	**Objective**	
5.	**Outcome**	

6.	**Theory**	**C. Theory ::**
		    1. Introduction to graph
		    2. Graph terminology with diagram
		    3. ADT of Graph
		    4. Graph representation using Array, diagram, advantages, disadvantage over linked organization, right and left child address calculation
		    5. Graph representation using linked organization , diagram, advantages, limitations over array
		    6. List down applications of graph
		    7. Spanning tree concept and example
		    8. Minimum spanning tree and its use cases

7.	**Algorithms /Pseudocode:**	Write down the pseudocode for the, explain the and trace the algorithms with appropriate example 1. Prims algorithm 2. Kruskals algorithm
8.	**Test cases/validation**	**Test cases :** 1. consider complete undirected graph , with no loop, parallel edges 2. Test for unconnected graph ,check the output for prims and kruskals both **Validations :** 1. no of Vertex and no of edges are positive integer no. 1. Test for –ve weight 2. Start and end vertices are with in the no of vertices provided by the user
09	**Program**	Printout /Softcopy
10.	**Results /output**	Including test cases , validations and valid inputs based results .

PUNE INSTITUTE OF COMPUTER TECHNOLOGY

INFORMATION TECHNOLOGY

ACADEMIC YEAR -2020_21

SUB: DSA 2019 course   Semester – I

DSFL ASSIGMENT NO 7 WRITUP OUTLINE

11.	**Conclusion**	Write down the Space and time analysis of prims and kruskals Compare prims and kruskals with respect to time and space complexity , sparse and dense graph , for the unconnected graph input .

Seema H Chandak
DSAL – Coordinator 2020_21