**Assignment-8 (30 points)**

**Graph Data Structure**

**Due date: 11/18/2022**

Note: graph\_ds word file is uploaded in Canvas which contains the basic methods of graphs.

**Part-1:** Write a class for graph data structure containing the following functions:

1. Function to generate the list of all edges
2. Function to calculate isolated nodes of a given graph
3. Function to find a path from a start vertex to an end vertex
4. Function to find all the paths between a start vertex to an end vertex
5. Function to check if a graph is a connected graph.
6. Function to perform BFS
7. Function to perform DFS

**Part-2:**

1. Write the Kruskal’s algorithm and briefly explain the algorithm. Perform algorithm analysis to find the time complexity.
2. Write the Prim’s algorithm and briefly explain the algorithm. Perform algorithm analysis to find the time complexity.
3. Write the Dijkstra’s algorithm and briefly explain the algorithm. Perform algorithm analysis to find the time complexity.

Note: each function should take a graph as a parameter along with other required parameters. Check each function with an example. You might require more examples (test examples (minimum: 2)) for the completion of this assignment. Exercise:1-5 is already given in the graph\_ds file. Some functions in the file might not take graph as an input parameter. Explain each function in 2-3 lines. Exercise: 1-5 carries 2 points each and exercise: 6-10 carries 4 points each.

Attach the code and screenshots of your results here.