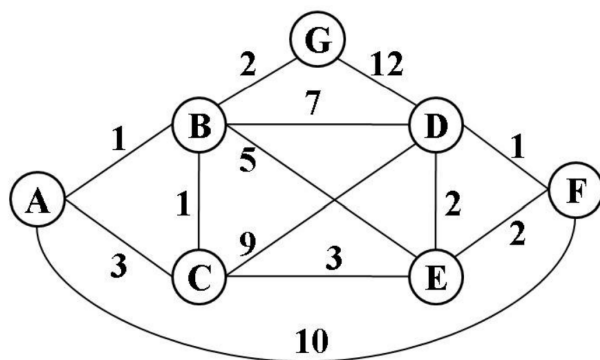


CSCE 52803: Assignment 1

Due 11:59pm Friday, September 11, 2026

NOTE: All graphs are simple graphs by default. Please format your answers using either Word or Latex.

1. Let K_n be the complete graph with n vertices ($n \geq 3$). How many subgraphs of K_n that are K_{n-2} ?
2. Let G be a graph and $\delta(G)$ be the minimal degree of any vertex in G . Suppose that $\delta(G) \geq 2$. Prove that G contains a path of $\delta(G)$ and a cycle of length at least $\delta(G) + 1$. (Hint: consider the longest path in the graph)
3. Consider the following undirected graph. What is the shortest path from A to F computed by Dijkstra's algorithm?



4. In the class, we introduced the Prim's algorithm for building the minimum spanning tree which is a greedy approach. Prove that the Prim's algorithm produces a globally optimum solution.
5. In the class, we introduced an algorithm for finding Euler circuits. Similarly, develop an algorithm for finding Euler paths.