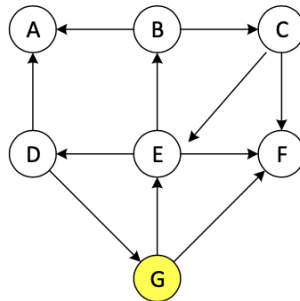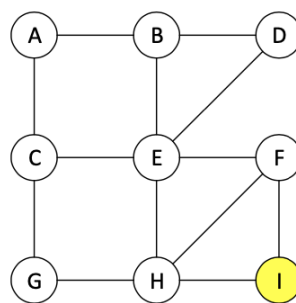**Problem 1 (10 points).** Run the DFS on the following graph beginning at node G and show the sequence of nodes generated by the search. When you have two or more choices as the next node to visit, choose them in the alphabetical order.

After completing the DFS, classify each edge as a *tree edge,* a *forward edge,* a *back edge,* or a *cross edge.*

DFS:	Classify each edge:
G, E, B, A	Tree edge: (G, E), (E, B), (B, A), (C, F), (C, E), (E, D)
Backtrack to B:	Forward edge: (G, E), (E, B), (B, A), (C, F), (C, E), (E, F), (E, D), (G, F)
B,C,F,	Back edge: (C, E), (D, G)
Backtrack to C,	Cross edge:(D, A)
C, E, D	
Finished	

Problem 2 (10 points). Run the BFS on the following graph beginning at node I and show the sequence of nodes generated by the search. When you have two or more choices as the next node to visit, choose them in the alphabetical order.
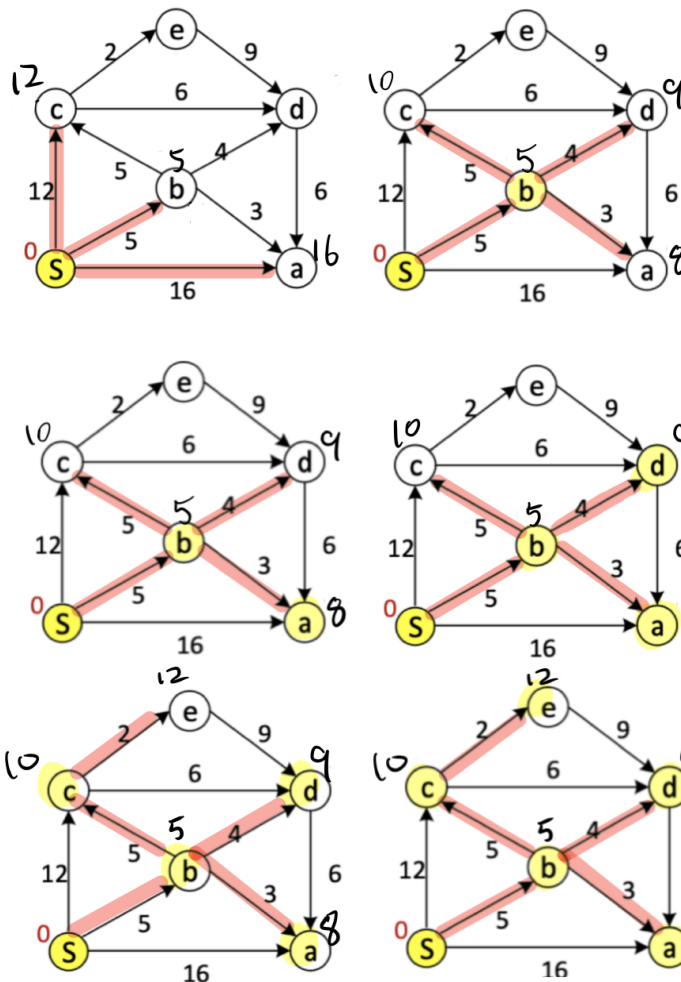

I => F, H
F => E
H => G
E => B, C, D
G => None
C => A
 sequence: I, F, H, E, G, B, C, D, A

Problem 3 (10 points). Run the Dijkstra's algorithm on the following graph beginning at node S.
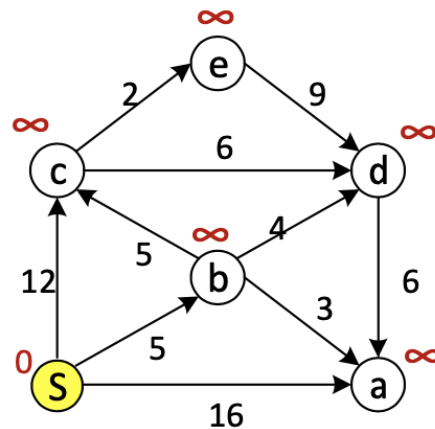
Problem 3-(1). After each iteration, show the D values of all nodes (initial D values are shown above each node in red).
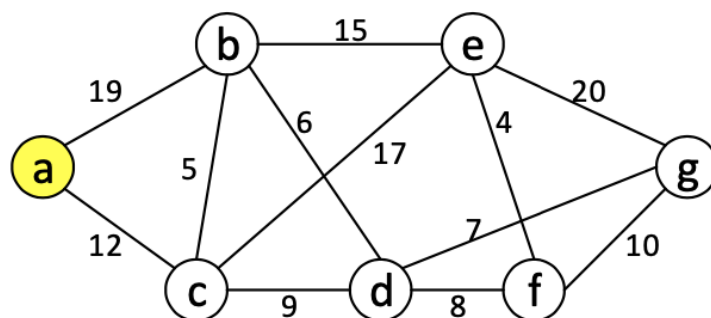

Problem 3-(2). Show the shortest path from S to every other node generated by the algorithm
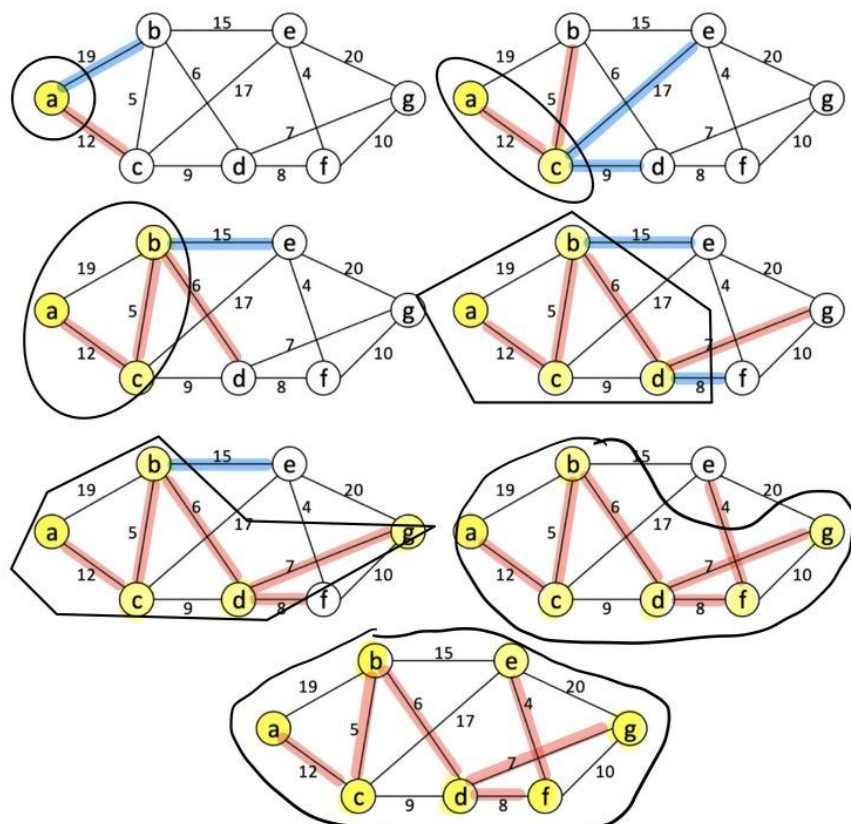
S => B => A => D => C => E

5 + 3 + 4 + 5 + 2 = 19

Problem 4 (10 points). Run the Prim-Jarnik algorithm on the following graph beginning at node a.

Problem 4-(1). Show the sequence of nodes in the order they are brought into the "cloud."

a,c,b,d,g,f,e

Problem 4-(2). Show the minimum spanning tree T, generated by the algorithm, as a set of edges.

$$w(T) = \sum_{(u,v)\ in\ T} w(u, v)$$

12 + 5 + 6 + 7 + 8 + 4 = 42