

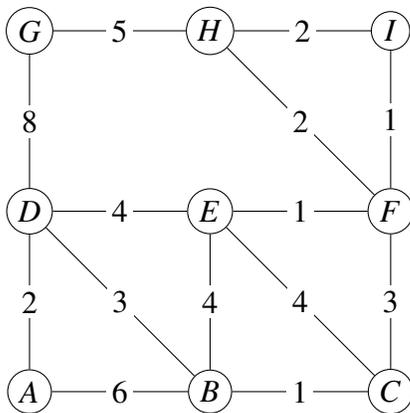
Name: _____ score: _____ / 10

There are 10 points possible on this quiz. No aids (book, notes, etc.) are permitted. You may use a non-programmable calculator. **Show all work and supporting calculations for full credit. Explain how you get your answers.**

1. (5 pts.) Recall Kruskal's algorithm roughly says the following:

Kruskal's Algorithm Select the cheapest edge in the graph that does not create a circuit. Stop when a spanning tree is obtained.

Use Kruskal's Algorithm to find a minimum weight spanning tree in the graph below. Break ties by choosing the alphabetically earliest edge first.



used?	edges	weights
	BC	1
	EF	1
	FI	1
	AD	2
	FH	2
	HI	2
	BD	3
	CF	3
	BE	4
	CE	4
	DE	4
	GH	5
	AB	6
	DG	8

Draw the minimum weight spanning tree below.



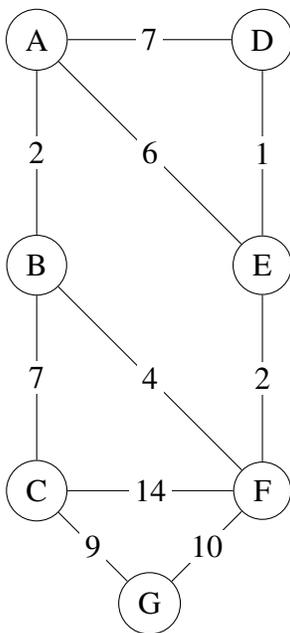
What is the total weight of the spanning tree you found? _____

2. Recall Dijkstra's algorithm roughly says the following:

Dijkstra's Algorithm

- (i) Mark the ending vertex with a distance of zero and label it as **current**.
(FYI: Once a **current** vertex is explored, it will be labelled **visited** and never considered again.)
- (ii) Let v be the current vertex. For every vertex w with an edge to v **not marked as visited**, calculate the distance from w to e through v . If this distance is smaller than the present distance, update w with the new distance. Otherwise, do nothing.
(FYI: This number is called the tentative distance to e .)
- (iii) Mark the current vertex as **visited**. Never look at this vertex again.
- (iv) Identify the **un-visited** vertex with the smallest distance to e . Mark it as current and return to step (ii). You know when to stop when vertex s is labeled as **current**.

Use Dijkstra's Algorithm to determine the shortest (weighted) distance from vertex A to vertex G .



vertex	current/ visited	tentative minimum distance to G	preceding vertex
A			
B			
C			
D			
E			
F			
G			

Length of the shortest path from A to G : _____

Find the shortest path from A to G . The last column of the table should support your answer.

Path: _____