CS 1501 Quiz 2

KEY
1. (3 points) What is the runtime of Lazy Prim’s?

**ANSWER:**
\( \Theta(\text{edge}) \)

2. (6 points) Consider the following function from DijkstraSP.java. Fill in the blanks with the appropriate values.

```java
// relax edge e and update pq if changed
private void relax(DirectedEdge e) {
    int v = e.from(), w = e.to();

    if (distTo[_________] > distTo[_________] + __________.weight()) {
        distTo[_________] = distTo[_________] + __________.weight();
        edgeTo[w] = e;
        if (pq.contains(w)) pq.decreaseKey(w, distTo[w]);
        else pq.insert(w, distTo[w]);
    }
}
```

**ANSWER:**
1 point per blank:

```java
// relax edge e and update pq if changed
private void relax(DirectedEdge e) {
    int v = e.from(), w = e.to();
    if (distTo[____w____] > distTo[____v____] + ____e____.weight()) {
        distTo[____w____] = distTo[____v____] + ____e____.weight();
        edgeTo[w] = e;
        if (pq.contains(w)) pq.decreaseKey(w, distTo[w]);
        else pq.insert(w, distTo[w]);
    }
}
```
3. (8 points) Consider performing a DFS traversal, starting from vertex A, on the following graph:

Assuming that neighbors are seen in ascending order, provide the following:

- List the vertices that are visited in the order that they are visited.
- Draw the spanning tree that would result from this traversal.

**Answer:**

5 points A B G D E F C
3 points
4. (8 points) Consider performing a BFS traversal, starting from vertex A, on the following graph:

Assuming that neighbors are seen in ascending order, provide the following:

- List the vertices that are visited in the order that they are visited.
- Draw the spanning tree that would result from this traversal.

**ANSWER:**

5 points  A B C E G F D
3 points