**CS 5/7350**

**Quiz #3 Due Mar 1 for Completion Grade**

Name & ID:\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ CS5370 Yes or No

1. [1 pt] Argue that the problem, S, of sorting an unsorted array of integers of length greater than 100 elements is at least as hard - and maybe even harder - than the problem, L, of finding the ten largest elements of the same unsorted array of integers.
2. [2 pts] A tree has the following In-Order and Pre-Order traversals. **Draw the tree**

In Order: A X R M B L H P Z S Q

Pre Order: M R A X P L B H Q X S

1. [1 pts] Answer the following 3 questions:
2. How much entropy does an entire message with 40A’s and 60 B’s have?
3. How much entropy does an entire message with 50A’s and 50 B’s have?
4. [2 pts] You have a complete graph with |V| vertices where |V| is >= 2. Each edge in this graph has a capacity of 7. You pick one vertex as the Start Vertex, S, and another vertex as the Sink Vertex, T. Since the is a complete graph, you will get the same answer regardless of which two vertices you pick. Answer the following questions:
   1. What is the length of the shortest path between Vertex S and Vertex T
   2. What is the maximum flow (in terms of |V|) between Vertex S and Vertex T
   3. What is the weight of the minimum spanning tree of the graph?