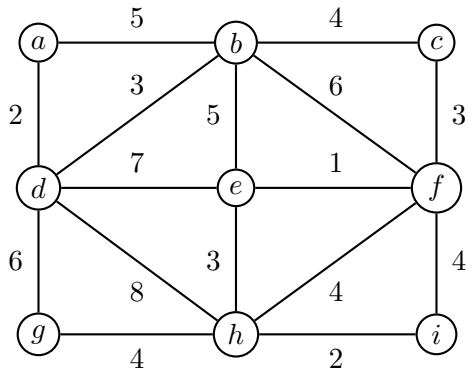
CS 228, Minimum Spanning Trees Etc.

Name:

Some questions are from **Discrete Mathematics and It's Applications 7e** by Kenneth Rosen.



- List the sequence of edges that will be selected by Prim's algorithm as it constructs a minimum spanning tree of the graph above. Draw the resulting tree and calculate its total weight.

- List the sequence of edges that will be selected by Kruskal's algorithm as it constructs a minimum spanning tree of the graph above. Draw the resulting tree and calculate its total weight.

- Draw the binary expression tree corresponding to the following expression:

$$(((2 \times (1 + 3)) \uparrow 2)/8) + ((6/3) \times 4)$$

- Use your expression tree to generate the prefix version of this expression.

- Use your expression tree to generate the postfix version of this expression.

- Use the Huffman coding algorithm to create a binary prefix code for the following letters and frequencies: a: .33, b:.03, c: .14, d: .22, e: .28. Recall that subtrees with higher frequencies end up on the left when subtrees are combined. Left branches should be labeled with '0' and right branches should be labeled with '1'.

- Use your prefix code to decode the following message: 111001001.

- Assuming that the message follows the frequency distribution described above, how many bits should it take to encode a message with 10,000 letters?