CSE 542 – Advanced Data Structures and Algorithms *Jon Turner*

Review Questions 10

Your Name:

Please print out this form (two-sided, if you can) and write your answers *legibly* in the spaces provided. If you can't write legibly, type. Answer the following questions based on the analysis on pages 6-8 of the supplementary notes.

1. Consider a "find-path" involving nodes u, v, w, x, y, z (with z as the root). If the node ranks are 2, 3, 5, 7, 13, 23, which nodes are on level 1, and which are on level 2? Which nodes are singular?

2. Consider the find path from the previous question. Suppose a find operation is done at u. After the find, which nodes are on level 1, and which are on level 2? Can the level of these nodes change any further as a result of future operations? Explain your answer.

3. Consider a partition data structure with 2^{20} nodes. What's the maximum number of nodes that can have rank 2? What is the maximum number than can have rank 3? Based on this, what is the maximum number of nodes with rank in *block*(1)? What is the maximum number with rank in *block*(2)?