Class Participation Quiz

Complete and submit this within 15 minutes.

General Information

Last Name _____ First Name _____

ID Number _____ Email _____

Fill in the blanks (or select T/F):

_____ $T(n) = T(\sqrt{n}) + O(1)$

_____ $T(n) = 2T(\sqrt{n}) + O(1)$

_____ IOs are necessary and sufficient to sort n comparable objects of $O(1)$ size in the IO Efficient model.

_____ is an upper bound on the query time of a point in kd-tree in fixed dimensions.

_____ is an upper bound on the sorting time in the PRAM model of computation.

Show proof on the back of this page.

T **F** For all weighted input graphs (with positive capacities), The Preflow push algorithm can be sped up by using capacity scaling.

T **F** Unit weight bipartite matching can be done using max flow algorithm.

T **F** In every directed graph with nodes s and t (and all edges having unit weight), the maximum number of edge-disjoint s-t paths is equal to the minimum number of edges whose removal separates s from t.

T **F** If a bipartite graph $G = (L \cup R, E)$ has a perfect matching, then $|N(S)| < |S|$ for all subsets $S \subseteq L$.

T **F** Factor is not in NP∩co-NP.

T **F** In fixed dimensions, LP can be solved in linear time.

T **F** LRU is $2k$-competitive.

Show in a two line proof, LP Feasibility and LP optimization are equivalent. (Use the following space on this page)