Habib University

CS 412: Design and Analysis of Algorithms

Spring 2024 – Quiz 03 – L2

March 15, 2024. Time: 25 minutes. Total points: 05.

1. **[2 points]** Let f be a flow in G and f' be the flow in the residual graph G_f for f. Then show that $f + f'$ is a flow in G of value $|f| + |f'|$.

2. **[2 points]** An edge of a flow network is called ***critical*** if decreasing the capacity of this edge results in a decrease in the maximum flow. Suggest an efficient scheme [in pseudocode form] that finds a critical edge in a network.

3. Find maximum matching in the following bipartite graph [from Lin *et al.*]. Show the working.