Data Structures and Algorithms

Explain what is meant by the terms directed graph, undirected graph and bipartite graph. [3 marks]

Given a bipartite graph, what is meant by a matching, and what is an augmenting path with respect to a matching? [4 marks]

Prove that if no augmenting path exists for a given matching then that matching is maximal. [6 marks]

Outline an algorithm based on this property to find a maximal matching, and estimate its cost in terms of the number of vertices $n$ and edges $e$ of the given bipartite graph. [7 marks]