2001 Paper 12 Question 1

Data Structures and Algorithms

(*a*) Describe and justify an algorithm for finding the shortest distance between each pair of vertices in an undirected graph in which each edge has a given positive length. If there is no path between a pair of vertices a very large result should arise. [12 marks]

(*b*) Is it sensible to use your algorithm to discover whether such a graph is connected? Suggest an alternative that would be appropriate for a graph of 1000 vertices and 10,000 edges. [8 marks]