Homework Exercise
Due: February 18, 2002

4. Consider the problem of solving consensus in a synchronous message-passing system where the network is described by the undirected graph G, and the number of *halting failures* that may occur is f.

Give a characterization of the graphs G for which the problem is solvable. That is, give some property of graphs and then prove

(a) if G has this property then the problem is solvable (describe the algorithm), and

(b) if G does not have this property, then the problem is unsolvable (explain why).

Also, give the time and message complexity of the algorithm you describe in part (a). How does its complexity compare with the algorithm we gave in class for the complete graph?