

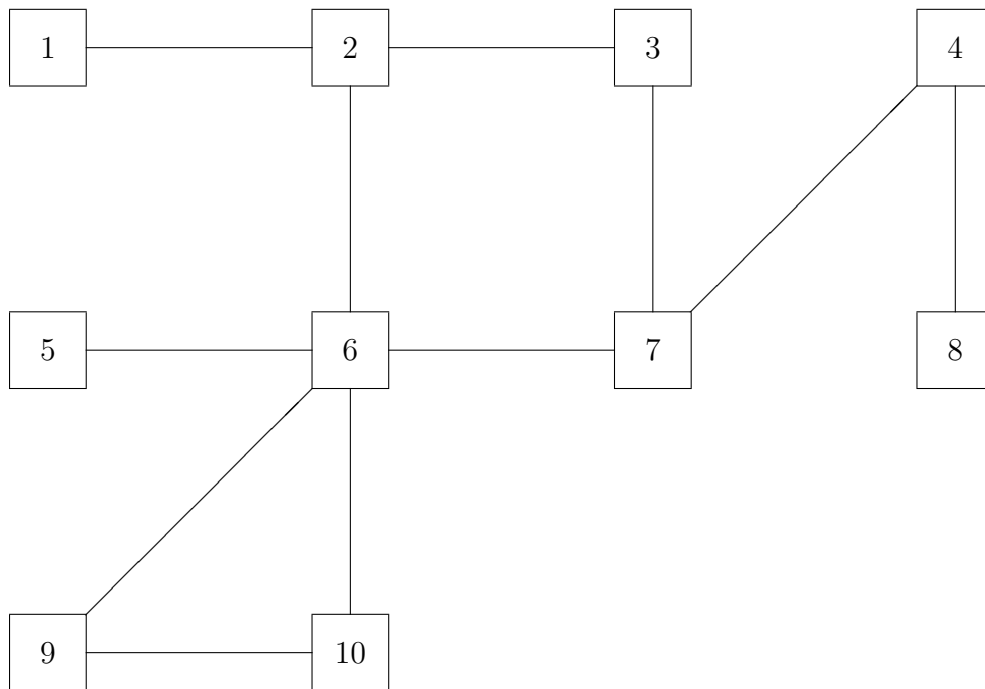
# Principles of Communications

## Supervision Questions Set 2: Graph Theory and Routing

Marks are given for guidance only. The exam questions are intended to be optional and it is left up to your supervisor whether they will require you to do them or not.

July 2012

1. (a) For the following graph give the degree of each node and the average node degree for the whole graph (5 Marks):



- (b) What is the diameter of this graph? If you are allowed to add 1 edge what is the minimum diameter you could achieve? (3 Marks)
- (c) Explain the terms tree, spanning tree and subgraph (4 Marks).
- (d) Find a minimum spanning tree in the above graph (3 Marks).
2. Describe the dynamic alternative routing system (5 Marks).
3. Compare and contrast intra-domain routing with inter-domain routing. Explain why distance vector routing is used for inter-domain routing and link state routing is used for intra-domain. Why cant they be used the other way round? (10 Marks).
4. (a) Describe the count to infinity problem in Distance Vector routing. Use an example to illustrate the problem. (6 Marks).
- (b) Use your example to explain how poisoned reverse solves the problem (4 Marks).
5. (a) Describe how reverse path forwarding works in multicast. Explain how it ensures you find the shortest path (2 Marks).
- (b) Explain what is meant by pruning (2 Marks).
- (c) Briefly describe 3 more multicast routing protocols (6 Marks).

## Exam Questions

2011 Paper 7, Question 11

2010 Paper 9, Question 6