CS 372 Introduction to Computer Networks
Self-Check Exercises: Lecture 25 **Solutions**

1) What does a routing algorithm do? Where is the output of a routing algorithm stored?
Finds a path from a router to destination, and selecting it appropriately. The result of the algorithm is used to construct the router forwarding table (or routing table), which is stored in the router.

2) What is *switching fabric* in terms of networking? How is it controlled?
The hardware switching circuitry used, within routers, to switch datagrams from an input port to an output port (or queue) without any collisions occurring. This is controlled by the routing processor, which utilizes the stored routing table. The IP address of incoming datagrams are used to determine the output port.

3) Is it possible to have a queueing delay at the output port of a router? How? What about packet loss?
Yes, due to transmission rate limitations on the output port link: if several datagrams were switched to the same output port, they will have to wait for access to the transmission medium.
Packet loss can also occur, if the buffer overflows.

4) Is it possible to have a queueing delay at the input port of a router? How? What about packet loss?
Yes, due to head-of-line blocking or output port contention: if the datagram at the front of the line in the input port queue cannot be transferred to the output port because there is already a transfer occurring to, or a full queue at, the desired port. This would cause a delay in transferring the HOL datagram to its output port.
Packet loss can occur here as well, if the input buffer overflows.

5) Given the following routing table:

Prefix Match	Port
10001100 00011011 01011101	0
10001100 00011011 01011101 000	1
10001100 00011011 01011101 01	2
10001100 00011011 01011110 00100	3
Default	4

Use longest prefix matching to determine which output port is used for each IP address
   a. 140.27.93.25 Port #1
   b. 140.27.94.39 Port #3
   c. 140.27.95.32 Port #4
   d. 140.27.93.98 Port #2
   e. 140.27.93.156 Port #0