CS 372 Introduction to Computer Networks
Self-Check Exercises: Lecture 37 **Solutions**

1) What is a bus topology? How is it different from a ring topology?
   Each computer is attached to a shared medium, with a terminator on each end to absorb signal and prevent reflections. A ring topology does not have a terminator. Rather, its "ends" are connected to each other to form a ring.

2) How is a star topology different from those in Q1?
   A star topology does not have a shared medium. It has a series of point-to-point connections, each with one point being a central node (switch). Star-topology networks do not require multiple access control, since they have no shared medium. They are also full duplex on each of these point to point links.

3) What is a switch?
   A switch is a link-layer device (it has no network layer) which is used in forwarding link-layer frames.

4) What multiple access control scheme does bus Ethernet use?
   CSMA/CD

5) Why is there a short network diameter requirement in bus Ethernet?
   To prevent two nodes 'sensing' a free medium and starting transmission at close to the same time.

6) What is the purpose of the Ethernet "preamble"?
   It is used to synchronize clocks sender and receiver clocks. It is also used to signal the beginning of the rest of the Ethernet frame (since the clocks won't always synchronize in the same amount of cycles).

7) What does the Ethernet "type" field indicate?
   It identifies the network-layer protocol used in the datagram contained in the payload section.

8) How are errors detected in Ethernet? Does Ethernet incorporate error correction?
   A CRC check over the information in the frame is used to detect errors, but there is no error correction.