Question 1.

a) F  
b) T  
c) T  
d) F  
e) T  
f) F

Question 2.

a) T  
b) T  
c) T  
d) F  
e) T  
f) T

Question 3.

a) T  
b) T  
c) T  
d) F  
e) T  
f) T

Question 4.

a) Example: the sliding window protocol. The protocol retransmits data packets when the retransmission timer expires, which means that a data packet has not been ACKed by the receiver in time. The size of the window determines the length of the timer and also the type of the sliding window (go-back-n or selective-repeat). ACKs are control packets that acknowledge the receipt of a data packet. A lost ACK means that a retransmission of a data packet needs to be done.

Question 5.

a) In CSMA the nodes continue transmitting their frames even though there has been a collision, while in CSMA/CD each node stops transmitting its frame when it detects a collision. This increases performance by not transmitting a useless, damaged (by interference with a frame from another node) frame in its entirety. + figure according to your chosen text book.
The jam signal is used directly after when a collision has been detected and right before the exponential backoff. When the adapter detects a collision, that is, signal energy from other adapters, while transmitting, it stops transmitting its frame and instead transmits a 48-bit jam signal. When the jam signal is heard by the other stations they must stop transmitting as well and then enter the exponential backoff phase.

**Question 6.**

MIME keeps the 7-bit representation of an e-mail message intact, even though a multi-media message is being sent. This is accomplished through the use of special encodings: quoted-printable and base64.

**Question 7.**

a) The hidden terminal/node/station problem occurs on a wireless network where two nodes are sending to a common destination, but are unaware that the other exists, which results for example in the communication being scrambled at the destination.

b) This is not true. There are different types of wireless networks. Depending on their purposes, that is, the type of applications that they are designed for, they will use different protocols. Bluetooth does not use CSMA/CA.

**Question 8.**

a) Calculation:

Going via B gives (11, 6, 14, 18, 12, 8) by adding the vector values from B with the measured delay between C and B, and taking the minimum values.

Going via D gives (19, 15, 9, 3, 9, 10) by a similar calculation to the above.

Going via E gives (12, 11, 8, 14, 5, 9).

Taking the minimum for each destination except C gives the forwarding table of (11, 6, 0, 3, 5, 8). The outgoing lines are (B, B, –, D, E, B)

b) RIP.

**Question 9.**

a) T
b) F
c) T
d) F
e) T
f) T

d) F

c) F

**Question 10.**

a) The server is above and the client below. At the accept–connect phase the server and client are able to synchronize: the server is making itself ready to accept incoming con-
connections, blocking and passively waiting, while the client actively attempts to establish a connection request to the server.

b) A socket is an abstraction originally provided by Unix that provides the application programming interface (API) to TCP/IP.

**Question 11.**

Two types of transparencies in a distributed file system are:

- access transparency: hide differences in data representation and how a resource is accessed
- location transparency: hide where a resource is located

Transparency is the ability of the distributed file system to present itself to users and applications as if it were only a single computer system.

**Question 12.**

A CORBA service is an abstraction in the CORBA reference model, general purpose and independent of the application for which CORBA is being used, and similar to services offered by operating systems.

An example CORBA service is externalization, which deals with marshalling objects so that they can be stored on disk or sent across a network.