Question 1.

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

Question 2.

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

Question 3.

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

Question 4.

Max. two sentences.

a) IP best effort = It is the service model used by IP where delivery of a message is attempted but not guaranteed.

b) firewall = It is a router that has been configured to filter (not forward) packets from certain sources, and it is used to enforce a security policy.

c) congestion control = It is a network management strategy with the goal to alleviate or avoid congestion, implemented on the routers inside the network, by the hosts at the edges of the network, or by a combination of both.

Question 5.

b) The sending window size (SWS) is 10,000 bytes. The previous ACK no. was 22,001. The next received ACK no. is 24,001. We note that the ACK no. denotes the next expected packet to receive, that is, 24,001 means that 24,000 was received all
right, and 24,001 is expected as the next packet. Assume that we are using go-back-N as the sliding window and that the previous ACK was cumulative and emptied the window of sent-and-not-ACKed segments. Assume also that the packet size is 2000 bytes. The window before and after the receipt of this next ACK no. is then as follows:

**Question 6.**

a) In a recursive resolution, the query is delegated to another server who will look up the mapping by, in turn, delegating the query if needed to another server, and then return the answer to the original requestor. In an iterative resolution, the requestor is asking different name servers for a mapping and gets either the mapping or another name server’s address as an answer. If the answer is another server then the requestor needs to do another (iterative) query in the same way.

b) The reasoning is wrong because the DNS resolver only needs to know the IP address to the local name server when it sends its DNS request in a UDP packet, containing the hostname to be resolved. This address is hardcoded into the host’s network. The IP address mentioned in the question is not related to the DNS per se, but the function of the IP protocol in the network layer, which is hidden to the DNS in the application layer.

**Question 7.**

a) False. The routing protocols (link state and distance vector) have no limitations in the number of IP addresses connected to a device because they are only concerned with the cost to reach a destination. Furthermore, routers normally have several interfaces, each with its own IP address, so as to be able to interconnect with several other routers in order to create a network core with several alternative and possible paths/routes.

b) True. These are the actual definitions of the algorithms. In DV information (even if it is not complete) is distributed from neighbour to neighbour and used immediately for forwarding, while in LS information is broadcast (flooded) to the whole subnet and paths calculated and used first when the information is complete.
Question 8.
The distance is 200 m from one station to another via the hub, which is somewhere between the two stations. The propagation speed is 1.75 x 10^8 m/s. The delay in the hub for detecting a collision is 0.1 microseconds. The worst case scenario is when almost all bits from station A have arrived at station B and B suddenly also starts to transmit. The collision will have to travel all the way back from B to A for A to detect it. Therefore, the max. time between transmitting data and detect a collision is two times the distance between station A and station B, plus the delay for the collision detection in the hub, which gives us 2 x (200 m / 1.75 x 10^8) + 0.1 microsecs = 2 x 0.000001142 + 0.0000001 = 2.2856 microseconds + 0.1 microsec = approx. 2.39 microseconds.

Question 9.
a) S
b) F
c) S
d) F
e) S
f) S

Fråga 10.
a) IIOP är Internet-versionen av GIOP, d.v.s. den baseras på TCP/IP.
b) GIOP/IIOP är protokollet mellan två olika ORBer och möjliggör kommunikation mellan två olika implementationer av ORB-funktionen att fungera tillsammans.

Fråga 11.
a) IDL-beskrivningen är i princip som följer (jfr labbserien i kursen):
interface Hello
{
    boolean say_hello(in string bandNamn, out antalFragor);
    void shutdown();
};

b) Följande fyra filer skapas när IDL-beskrivningen kompileras i Corba: klient-stubbe, klientkod, server-skelett och serverkod.

Klientstubben innehåller de funktioner/metoder som klienten kan anropa och utför även un/marshalling av parametrarna till/från funktionerna. Server-skelettet utför på samma sätt un/marshalling av parametrarna som funktionerna innehåller samt hanterar inkommande anrop. Filerna med klientkod och serverkod fylls i av programmeren för att få funktionerna att utföra det de är designade att göra.

Fråga 12.
a) idempotent semantik = När man kan anropa en funktion hur många gånger som helst tills man lyckas utan risk att inte veta vilket tillstånd man har lämnat funktionen i. Exempel: läsa en fil.
b) RPC-register = innehåller nätadressen och namnet på den dator som tillhandahåller funktionen som RPC-anropet vill använda.

c) MOM = Message-oriented middleware; meddelandebaserad middleware som ger persistent och asynkron kommunikation.