Solutions for the exam in ETS052 2006-12-14
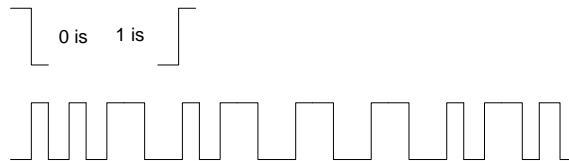
1. The answers are found in the book.
2.
   a. See the book
   b. (i) B, C, D
      (ii) Only B. A bridge breaks a collision domain.
   c. See the book
   d. See the book
3. The answers are found in the book.
4. The answers are found in the book.
5.
   a. ED 5C
   b. See the book.
   c. See figure below
   d. See figure below

      (c)

      (d)   Inversion: Next bit is 0; No inversion: Next bit is 1

   e. This exercise is not valid anymore, we will not calculate CRC for hexadecimal numbers.
   f. Each frame consists of 32 bits, and we need to use two slots to send our data (so two frames). The transmission rate is 1 000 000 bits per second, so the transmission time per bit is 1 μs. So two frames will have a transmission time of 64 μs.
6.
   a. 20 bytes
   b. 9467_{16}
   c. Do as in the exercises.
   d. Frame 1 and 2: More fragments (M bit). Frame 3: no flags are set.
   e. Protocol = 1, which means ICMP
   f. (i) 255.255.255.0 or /24
      (ii) Net id 200.34.0.0, host id 0.0.22.156
      (iii) 32768 – 2 (host id all ones and all zero not allowed)

7.
- a. The maximum number of subnets is 3. PC1+PC2 in one, DNS in one, and PC3+PC4 in one.
- b. The packet, encapsulated in a frame, will be forwarded on signal level, bit by bit, by the hub. The router will decapsulate the packet and forwards it to the next hop or final destination according to its routing table(s), encapsulated in a new frame. The switch will forward the frame on all ports if the destination is unknown to it, or on the destinations link otherwise.
- c. 2. Only routers count hops. There is only one hop.
- d. Assuming traffic seen by the Hub. Packets forwarded by the router on other links are not shown.
- e.

ARP req	MAC(pc2)	n/a	Broadcast	n/a	who has IP=rtr?
ARP reply	MAC(rtr)	n/a	MAC(PC2)	n/a	my IP is IP(rtr)
DNS req	MAC(pc2)	IP(pc2)	MAC(router)	IP(DNS)	What ip is www.eit.lth.se?
DNS Reply	MAC(rtr)	IP(DNS)	MAC(pc2)	IP(pc2)	www.eit.lth.se=IP(pc3)
http Get	MAC(pc2)	IP(pc2)	MAC(router)	IP(pc3)	GET index.html
http Put	MAC(rtr)	IP(pc3)	MAC(pc2)	IP(pc2)	content of file