TSN2201 COMPUTER NETWORKS

TUTORIAL 7 (Tri 1, 2017/2018)

1. Explain how the ALOHA, CSMA/CD, CSMA/CA protocols answers these questions:
   (a) What should be done if the medium is busy?
   (b) What should the station do if there is an access conflict?

2. Explain how the token-passing protocol answers these questions:
   (a) What should be done if the medium is busy?
   (b) What should the station do if there is an access conflict?

3. A network with one primary and four secondary stations uses polling. The size of a data frame is 1000 bytes. The size of the poll, ACK, and NAK frames are 32 bytes each. Each station has 4 frames to send. How many total bytes are exchanged if there is no limitation on the number of frames a station can send in response to a poll?

4. What is the difference between a unicast, multicast, and broadcast address?

5. Define the type of the following Ethernet destination addresses (unicast, multicast or broadcast address)

   a. 4A:30:10:21:1O:1A
   b. FF:FF:FF:FF:FF:FF
   c. 47:20:1B:2E:08:EE
   d. 06:01:02:01:2C:4B
   e. 07:01:02:03:04:05

6. What is the hexadecimal equivalent of the following Ethernet address?
   01011010 00010001 01010101 00011000 10101010 00001111

7. What are the advantages of dividing an Ethernet LAN with a bridge?

8. The data rate of 10Base5 is 10 Mbps. How long does it take to create the largest frame? Show your calculation.

9. An Ethernet MAC sublayer receives 1510 bytes of data from the upper layer. How many frames need to be sent? What is the size of data in each frame?

Practical Lab: Hub vs Switch

1. Create the following network topology using the Packet Tracer.
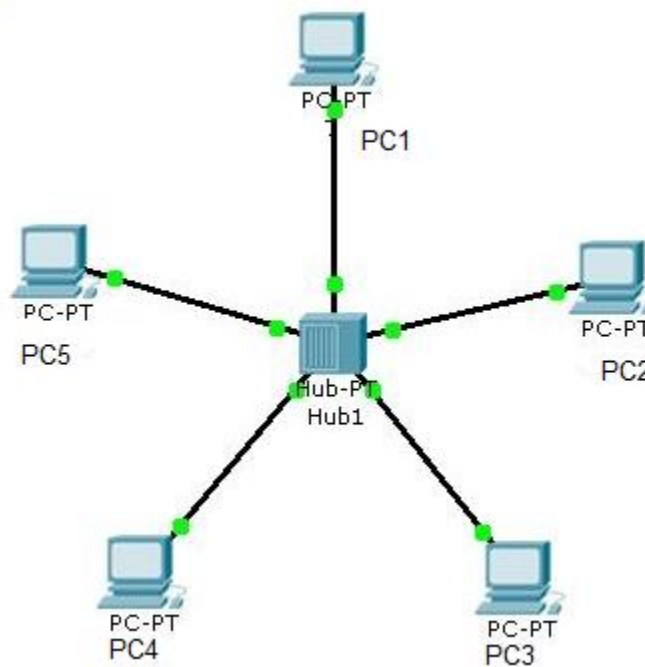
2. Assign IP address (according to the following table) to each of the PC in the network.

	IP address	Subnet Mask
PC1	192.168.5.1	255.255.255.0
PC2	192.168.5.2	255.255.255.0
PC3	192.168.5.3	255.255.255.0
PC4	192.168.5.4	255.255.255.0
PC5	192.168.5.5	255.255.255.0

3. How many collision domains in this network?

4. Select the **simulation mode**, click on the **edit filters**. Check only ARP and ICMP packets.

5. Send ICMP packets from PC1 to PC3 using the **Add Simple PDU**.

6. To observe the packet traffic in the network, click on the **Capture/ Forward** button. Repeat this step until the sending of ICMP packets completed.

7. When the hub received the ICMP packet from PC1, what is the action performed by the hub?

8. Send ICMP packets **concurrently** from PC1 to PC3 and PC2 to PC4. Can this be done successfully? Explain your answer.

9. Replace the hub with a switch. How many collision domains in the network after the replacement?

10. Repeat step 4 – 6 for the switched network.

11. When the switch received the ICMP packet from PC1, what is the action performed by the switch?
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12. Send ICMP packets **concurrently** from PC1 to PC3 and PC2 to PC4. Can this be done successfully? Explain your answer.