

# Tutorial 7

## Instructions

1. Form ad-hoc groups of 2 to 3 students to solve this week's exercise.
2. Each group must answer the following review Q's
3. Each group will use shared google docs to work with all group members and tutor. The document must include the group members' names and the tutorial sheet number.

## Review Questions

1. Q5-25. Assume the propagation delay in a broadcast network is **5 microseconds** and the frame transmission time is **10 microsecond**.
  - a) How long does it take for the first bit to reach the destination?
  - b) How long does it take for the last bit to reach the destination after the first bit has arrived?
  - c) How long is the network involved with this frame transmission (vulnerable to collision)?
2. Q5-27. Can two hosts in two different networks have the same link-layer address (MAC address)?
3. Q5-29. Do we need a multiple access protocol when we use the DSL service provided by the telephone company to access the Internet? Why?
4. Q5-33. How is the preamble field different from the SFD (Start Frame Delimiter) field in an Ethernet frame? (*Hint: refer to the figure 5.55*)
5. Q5-35. Why is there no need for CSMA/CD on a full-duplex Ethernet LAN?
6. Q5-37. What are the common Standard Ethernet implementations?
7. Q5-41. Four stations are connected to a **hub** in a transitional Ethernet network. The distances between the hub and the stations are 300m, 400m, 500m and 700m respectively. What is the length of this network and when we need to calculate  $T_p$ ?
8. Q5-43. What is **VLAN**? What does it mean to say that they "**communicate with each other as though they were on a single, isolated LAN**"? Define the purpose of VLAN and how VLAN help companies save time and money?
9. Q5-47. In ATM, what is the relationship between TPs, VPs, and VCs?
10. QP5-13. A simple parity check bit, which is normally added at the end of the word (changing a 7-bit ASCII character to a byte), **cannot detect even numbers of errors**. For example, two, four, six, or eight errors cannot be detected in this way. A better solution is to organize the characters in a **table and create row and column parities**. The bit in the row parity is sent with the byte, the column parity is sent as an extra byte (Figure below).

	C1	C2	C3	C4	C5	C6	C7	
R1	1	1	0	0	1	1	1	1
R2	1	0	1	1	1	0	1	1
R3	0	1	1	1	0	0	1	0
R4	0	1	0	1	0	0	1	1
	0	1	0	1	0	1	0	1

Row parities

Column parities

Rn: Row *n*  
Cm: Column *m*

Show how the following errors can be detected?

- a. An error at (R3, C3).
- b. Two errors at (R3, C4) and (R3, C6).
- c. Three errors at (R2, C4), (R2, C5), and (R3, C4).
- d. Four errors at (R1, C2), (R1, C6), (R3, C2), and (R3, C6).

11. QP5-17. This problem shows a special case in checksum handling. A sender has two data items to send:  $(4567)_{16}$  and  $(BA98)_{16}$ . What is the value of the checksum?