

Tutorial 6

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. Q5-1. Distinguish between communication at the network layer and communication at the data-link layer.
2. List some basic functions performed at the Data Link Control (DLC)
3. List some basic functions performed at the MAC layer.
4. List some basic functions performed at the LLC layer.
5. Q5-3. Explain why flags are needed when we use variable-size frames.
6. Q5-5. How does a single-bit error differ from a burst error?
7. Q5-7. In a block code, a dataword is 20 bits and the corresponding codeword is 25 bits. What are the values of k, r, and n according to the definitions in the text? How many redundant bits are added to each dataword?
8. Q5-9. What is the minimum Hamming distance?
9. If the **Divisor is 10011** and the **Dataword is "1010101010"** Find the **Codeword** with the help of Figure-5.13, which shows the method to calculate the Cyclic Redundancy check (CRC) encoder at the Transmitter. *Note this is also called as Frame Check Sequence (FCS) used in the Datalink layer for FRAMES in error detection?*

In the second part of the calculations if the received **Codeword** is **"10101010100110"** verify with the help of Figure-5.14, if the data Integrity of codeword is Valid or NOT?
10. Q5-19. Explain why there is only one address field (instead of two) in an HDLC frame.
11. List and briefly define three versions of ARQ?
12. Define what data transparency or bit stuffing is HDLC protocol? Explain how bit stuffing is achieved?
13. What are the three frame types supported by HDLC? Describe each of them.
14. A World Wide Web server is usually set up to receive relatively small messages from its clients but to transmit potentially very large messages to them. Explain, then which type of

ARQ protocol (selective reject, go-back-N) would provide less of a burden to a particularly popular WWW server.

15. Q5-21. Stations in a pure Aloha network send frames of size 1000 bits at the rate of 1 Mbps. What is the vulnerable time for this network? (refer to Figure 5.31)
16. QP5-7 Using the code in Table 5.2(Simple **EVEN** parity-check code) what is the data word if one of the following codeword is received?

<i>Datawords</i>	Codewords	<i>Datawords</i>	Codewords
0000	00000	1000	10001
0001	00011	1001	10010
0010	00101	1010	10100
0011	00110	1011	10111
0100	01001	1100	11000
0101	01010	1101	11011
0110	01100	1110	11101
0111	01111	1111	11110

- a. 01011 b. 11111 c. 00000 d. 11011
17. Q5-23. To understand the uses of K (number of attempts) in CSMA/CD in Figure 5.40, find the probability that a station can send immediately in each of the following cases:
- a) After **one** failure.
- b) After **three** failures.

Figure 5.40: Flow diagram for the CSMA/CD

