CS2105   **Tutorial 7**   Semester 2 AY18/19

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1. **[KR, Chapter 6, R2]** If all the links in the Internet were to provide reliable delivery service, would the TCP reliable delivery service be redundant? Why or why not?

2. **[KR, Chapter 6, P5/P6]** Consider a 4-bit generator G with value **1001**, what is the CRC checksum R if data D has the following value?

    a) **11000111010**

    b) **01101010101**

    c) **11111010101**

    d) **10001100001**

3. Consider the following two-dimensional parity matrix.

    $$\begin{matrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \end{matrix}$$

    a) Give an example of a 1-bit error that can be detected and corrected.

    b) Give an example of a 2-bits error that can be detected but cannot be corrected.

    c) Give an example of a 4-bits error that cannot be detected.

4. There are many nodes in a shared medium network and most nodes are likely to transmit frequently. Which of the following multiple access protocol(s) is (are) suitable? (1) TDMA; (2) CSMA; (3) Token passing.

5. Nodes A and B are accessing a shared medium using CSMA/CD, with propagation delay of 245 bit times between them (i.e., propagation delay equals to the amount of time to transmit 245 bits). Minimum frame size is 64 bytes. Suppose node A begins transmitting a frame at $t = 0$ bit time. Before A finishes, node B begins transmitting a frame. Assume no other nodes are active.

   Write down your answers to the following 2 questions in the unit of **bit time**.

   a) When is the latest time, by which B can begin its transmission?

   b) Suppose B begin its transmission at the time computed in a), can A detects that B has transmitted before it finishes transmission?