

National University of Singapore
School of Computing

CS2105

Tutorial 7

Question paper

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.

0	1	0	1
1	0	1	0
0	1	0	1
1	0	1	0

 - 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?