

National University of Singapore
School of Computing

CS2105

Tutorial 8

Question paper

1. **[KR, Chapter 5, 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 5, 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.

Time distributed multiple access: go through all the nodes, see if got stuff to transmit, else pass

Carrier sense multiple access: check if anyone is using the channel

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?

