National University of Singapore

School of Computing

CS2105  **Tutorial 7** 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 with value **1001**, what is the CRC checksum if data has the following value?
3. **11000111010**

**11000111010000  
1001  
 1010  
 1001  
 1111  
 1001  
 1101  
 1001  
 1000  
 1001  
 1100  
 1001  
 1010  
 1001  
 110**

**R = 110**

1. **01101010101  
   01101010101000  
    1001  
    1000  
    1001  
    1101  
    1001  
    1000  
    1001  
    1100  
    1001  
    1000  
    1001  
    001  
   R = 001**
2. **11111010101  
   11111010101000  
   1001  
    1101  
    1001  
    1000  
    1001  
    1101  
    1001  
    1000  
    1001  
    1100  
    1001  
    1010  
    1001  
    011  
   R = 011**
3. **10001100001  
   10001100001000  
   1001  
    1110  
    1001  
    1110  
    1001  
    1110  
    1001  
    1110  
    1001  
    1111  
    1001  
    1100  
    1001  
    1010  
    1001  
    110  
   R = 110**
4. Consider the following two-dimensional parity matrix.
5. Give an example of a 1-bit error that can be detected and corrected.

0100 1  
1010 0  
0101 0  
1010 0  
0001 1

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

0101 0  
0010 1  
0101 0  
0010 1  
0000 0

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

1100 0  
0011 0  
0101 0  
1010 0  
0000 0

1. 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.
2. Nodes and 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 begins transmitting a frame at bit time. Before finishes, node 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**.

1. When is the latest time, by which can begin its transmission?
2. Suppose begin its transmission at the time computed in a), can detects that has transmitted before it finishes transmission?