國立交通大學八十九學年度碩士班入學考試試題

科目名稱：計算機概論(471)　　考試日期：89年4月23日 第 3 節

系所班別：資訊管理研究所　組別：甲組　　第 / 頁，共 3 頁

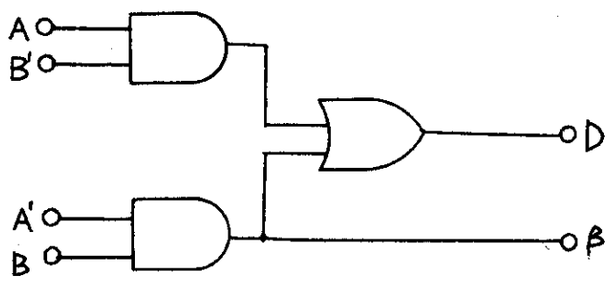
＊作答前，請先核對試題、答案卷（試卷）與准考證上之所組別與考試科目是否相符!!

1. (10%)
   (1) What is the main difference of latches and corresponding flip-flops?
   (2) Explain the function of a master-slave flip-flop.

2. (10 %)
   The code size of program A is twice as large as the code size of program B. A and B are identical in program behavior to a user.
   (1) Explain why this is possible. (2) Which program do you prefer? Why?

3. (15%)
   (1) (10%) Write a program (in any programming language) that can take an input of 8 bytes key, k and a file name, fA.
   The program will ouput a file fB = XOR (fA, k)
   (2) (5%) What would be the application of this program?

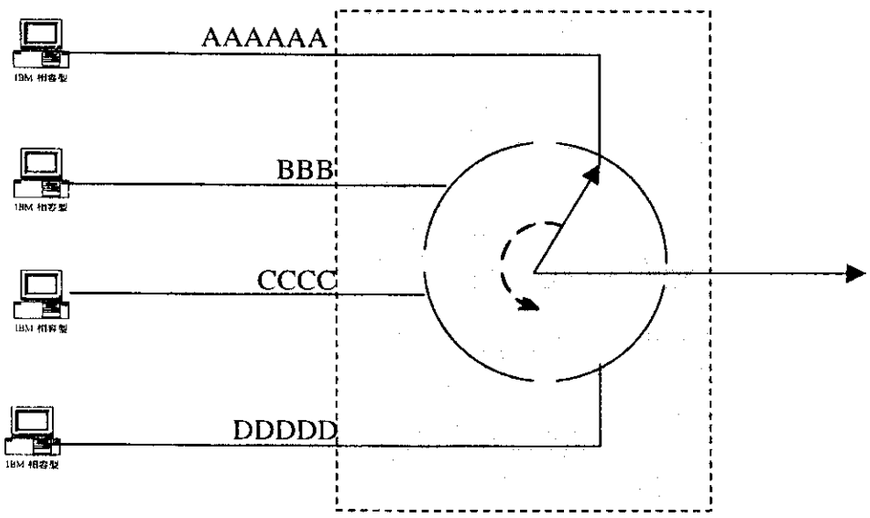
4. (5%)
   What is the function of the following logic circuit?



5. Please explain how multiplexer is functioning. (5%)

6. (a) The synchronous time-division multiplexing (TDM) can be compared to a very fast rotating switch. As the switch opens in front of a device, that device has the opportunity to send a specified amount (x bits) of data onto the path. The switch moves from device to device at a constant rate and in a fixed order. This process is called interleaving.

In the following figure, it shows the synchronous TDM multiplexing process:



Multiplexer

In above figure, the switch is rotating counter clockwise. As we interleave the various transmissions by character (equal to one byte each) from each computer station (the data are shown in each computer station), please show the final data stream from the multiplexer output. (5%)

(b) Can you design the demultiplexer from the above figure and show the demultiplexing process and results. (10%).

(c) In (a), we don't consider the line speed at the input and the multiplexer. If the speed of the data stream at the input line is different from the rate of the multiplexer switch, please describe what will happen and the results. (5%)

7. Describe different kinds of file protection. (5%)

8. Describe the performance criteria for comparing CPU scheduling algorithms. (5%)

9. What are the software characteristics? (5%)

10. Describe the four layers of the OO design pyramids. (10%)

11. Explanation: (10%)
    a. Entity- Relationship diagram
    b. Data flow diagram
    c. Waterfall model