

國立勤益技術學院九十五學年度研究所一般招生筆試試題卷

所別：資訊與電能科技研究所

組別：資訊

科目：計算機概論

准考證號碼：□□□□□□□□ (考生自填)

考生注意事項：

一、考試時間 100 分鐘。

二、

三、

試題一：〈15 分〉

Consider a two-level memory hierarchy,  $M_1$  and  $M_2$ . Denote the hit ratio of  $M_1$  as  $h$ . Let  $c_1$  and  $c_2$  be the costs per kilobyte,  $s_1$  and  $s_2$  the memory capacities, and  $t_1$  and  $t_2$  the access times, respectively.

- What is the average cost  $c$  of the entire memory system?
- What is the effective memory-access time  $t_a$  of this hierarchy?
- Let  $r = t_2/t_1$  be the speed ratio of the two memories. Let  $E = t_1/t_a$  be the *access efficiency* of the memory system. Express  $E$  in terms of  $r$  and  $h$ .

試題二：〈15 分〉

Consider  $n$  tasks are presented to a  $k$ -stage linear-pipeline processor with clock period  $\tau$ .

- What is the *speedup*  $S$  of a  $k$ -stage linear pipeline processor over an equivalent nonpipelined processor?
- Determine the *efficiency*  $E$  of the  $k$ -stage linear pipeline processor.
- Find the *throughput*  $H$  of the  $k$ -stage linear pipeline processor.

試題三：〈20分〉

Finish the following Boolean equations:

(a)  $\bar{A} + AB =$  \_\_\_\_\_.

(b)  $\bar{A}B + \bar{A} =$  \_\_\_\_\_.

(c)  $X \oplus 1 =$  \_\_\_\_\_.

(d)  $f(A,B,C) = \sum m(1,4,5,6,7) =$  \_\_\_\_\_.

試題四：〈30分〉

**What does the following program print?**

```
import javax.swing.*;
public class TriSelect3 {
    public static void main( String args[] ) {
        String input;
        TriBank callTri3=new TriBank();
        TriBank callTri5=new TriBank(5);
        callTri5.drawRU();
        callTri3.drawLU();
        System.exit(0);    }}
public class TriBank {
    int row, column, space,size;
    public TriBank() {
        size=3;    }
    public TriBank(int psize) {
        size=psize;    }
    void drawLU() {
        for ( row = 1; row <=size; row++ ) {
            for ( column = 1; column <= row; column++ )
                System.out.print( '*' );
            System.out.println();    }
            System.out.println();    }
    void drawRU() {
        for ( row = size; row >=1; row-- ) {
            for ( space = 1; space < row; space++ )
```

```

        System.out.print ( ' ' );
    for (column = size; column >= row; column-- )
        System.out.print( '*' );
        System.out.println(); }}
void drawRD() {
    for ( row =size; row >= 1; row-- ) {
        for ( space = size; space > row; space-- )
            System.out.print( ' ' );
        for ( column = 1; column <= row; column++ )
            System.out.print( '*' );
        System.out.println();}
        System.out.println();}
}

```

試題五：〈20分〉

**Find the error in the following recursive method and explain how to correct it:**

```

public int love(int points )
{
    if ( points==0 )
        return 0;
    else
        return points*love( points )
}

```