

國立臺北科技大學 101 學年度碩士班招生考試

系所組別：4300 資訊與運籌管理研究所

第一節 計算機概論 試題

第一頁 共二頁

注意事項：

1. 本試題共八題，配分共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

1. What does the following program print? (10%)

```
class Ate
{
    public Ate()
    {
        System.out.println("Ate constructor");
    }
}
//=====
class My extends Ate
{
    public My()
    {
        System.out.println("My constructor");
    }
}
//=====
class Pie extends My
{
    public Pie()
    {
        System.out.println("Pie constructor");
    }
}
//=====
class Ex1
{
    public static void main(String[] args)
    {
        Pie c = new Pie();
    }
}
```

2. What does the following program print? (10%)

```
class Ex2
{
    public static void main(String[] args)
    {
        r2(5);
        System.out.println(); // go to next line
    }
}
//-----
public static void r2(int x)
{
    if (x == 0)
        System.out.print("E");
    else
        if (x == 1)
        {
            System.out.print("A");
            r2(6); // parameter value jumps up to 6
            System.out.print("B");
        }
    else
    {
        System.out.print("C");
        r2(x - 2);
        System.out.print("D");
    }
}
}
```

注意：背面尚有試題

3. What does the following program print? (10%)

```

class R
{
    public void xDisplay()
    {
        // dummy method
    }
}
=====
class P extends R          // P subclass of R
{
    private int x = 1;
    public void xDisplay()
    {
        System.out.println("x = " + x);
    }
}
=====
class Q extends R          // Q subclass of R
{
    private int x = 2;
    public void xDisplay()
    {
        System.out.println("x = " + x);
    }
}
=====
class Ex3
{
    public static void main(String[] args)
    {
        R[] z = new R[3];          // create R array

        z[0] = new P();           // init array with objects
        z[1] = new Q();           // of different types
        z[2] = new P();

        for (int i = 0; i < z.length; i++)
            z[i].xDisplay();
    }
}

```

4. Consider the following page-reference string:

1,2,3,4,2,1,5,6,2, 1,2,3,7,6,3,2,1,2,3,6

How many page faults would occur for the FIFO, Optimal and LRU replacement algorithms, assuming three frames? Remember that all frames are initially empty, so your first unique page will all cost one fault each. (15%)

5. Describe what Classes A, B and C of IP addresses are. (15%)

6. Consider a channel on which errors are isolated and the error rate is 10^{-6} per bit. Let the block size be 1000 bits. To provide error correction for 1000-bit blocks, 10 check bits are needed. To merely detect a block with a single 1-bit error, one parity bit per block will suffice. Assume that one megabit data is transmitted on that channel. What are the total overheads for the error detection method and error correction method? (10%)

7. Write the status of the list (26, 5, 77, 1, 61, 11, 59, 15, 48, 19) after each phase of the heap sort algorithm. (15%)

8. Explain and compare three ways to pass arguments in method calls (or function calls) in many programming languages: call-by-value, call-by-address, and call-by-reference. (15%)