

國立臺北科技大學九十九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。

一、What does the following program print? (10%)

```
import java.util.*;
class Ary{
    public static void main(String[] args) {
        int original[] = {3, 5, 1, 8, 9, 7, 4};
        int [] result = new int [7];
        int [] x = new int [10];
        int i, temp;
        for (i=0; i<10; i++) x[i] = 0;
        for (i=0; i<7; i++) x[original[i]] = x[original[i]] + 1;
        for (i=1; i<10; i++) x[i] = x[i] + x[i-1];
        for (i=0; i<7; i++) {
            result[x[original[i]]-1]=original[i];
            x[original[i]] = x[original[i]]-1;
        }
        showArray(original);
        showArray(result);
    }
    public static void showArray(int[] array){
        System.out.print("陣列的內容是：");
        for (int i = 0; i < array.length; i++)
            System.out.print(array[i] + " ");
        System.out.println("\n=====");
    }
}
```

二、What does the following program print? (10%)

```
public class Print {
    public static void main(String[] args) {
        char ch = 'A';
        int i = 1, m;

        do {
            m = i;
            do {
                System.out.print(ch);
                ch++;
                m--;
            } while (m > 0);
            System.out.println();
            if (ch == 'Z') break;
            i = i + 2;
        } while (true);
    }
}
```

三、What does the following program print? (10%)

```
#include <iostream>
using namespace::std;

void main()
{
    int i=0, j, k=112, a[32];

    while ( k > 0 ) {
        a[i] = k % 2;
        k = k / 2;
        i++;
    }
    for (j=i-1; j>=0; j--) cout << a[j];
    cout << endl;
}
```

注意：背面尚有試題

四、 Suppose we have the preorder sequence:

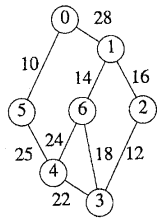
A B C D E F G H I

and the inorder sequence:

B C A E D G H F I

of the same binary tree. What is the binary tree? (10%)

五、 Given the following weighted graph, show the detailed steps in Kruskal's algorithm and Prim's algorithm for that graph. (20%)



六、 Write an algorithm to compute the shortest paths from each vertex in a weighted graph to each of the other vertices. The weights are nonnegative numbers. (20%)

七、 Describe how virtual private networks (VPNs) work. (10%)

八、 Describe the detailed steps of the fetch-execute cycle for executing an instruction. (10%)