

國立臺北科技大學九十六學年度碩士班招生考試

系所組別：1650 電機工程系碩士班戊組

第一節 計算機概論 試題

第一頁 共二頁

注意事項：

1. 本試題共九題，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、(5分) Please describe a method to compare the performance of a machine based on a PowerPC to one based on a Pentium.

2. (5分) What is the Dual-Core CPU?

二、(10分) Consider a router that interconnects three subnets: Subnet 1, Subnet 2, and Subnet 3. Suppose all of the interfaces in each of these three subnets are required to have the prefix 223.1.17/24. Also suppose that Subnet 1 is required to support up to 125 interfaces, and Subnets 2 and 3 are each required to support up to 60 interfaces. Provide three network addresses that satisfy these constraints.

三、(10分) Suppose you are given 32 processors, each capable of finding the sum of two multidigit numbers in a millionth of a second. Describe how parallel processing techniques can be applied to find the sum of 64 numbers in only six-millionths of a second. How much time does a single processor require to find the same sum?

四、(15分) If each time slice in a time-sharing system is 50 milliseconds and each context switch requires at most a microsecond, how many processes can the machine service in a single second? If each process uses its complete time slice, what fraction of the machine's time is spent actually performing processes? What would this fraction be if each process executed an I/O request after only a microsecond of its time slice?

五、(10分) Find the appropriate value for the decrypting key n and d in an RSA public key cryptography system based on the primes $p=7$ and $q=19$ and the encryption key $e=5$.

六、(10分) Before A, B, C, and D ran a race they made the following predictions

A predicted that B would win.

B predicted that D would be last.

C predicted that A would be third.

D predicted that A's prediction would be correct.

Only one of these predictions was true, and this was the prediction made by the winner. In what order did A, B, C, and D finish the race?

七、(10分) Suppose the procedure Modify is defined in pseudocode by

```
procedure Modify (Y)
```

```
Y ← 9;
```

```
print the value of X;
```

```
print the value of Y.
```

Also suppose that X is a global variable. If parameters are passed by value, what will be printed when the following program segment is executed? What if parameters are passed by reference?

```
X ← 5;
```

```
apply the procedure Modify to X;
```

```
print the value of X;
```

注意：背面尚有試題

八、(10分) Modify the following program so that the class defines a queue rather than a stack.

```
Class StackOfIntegers
{private int[] StackEntries = new int[20];
 private int StackPointer = 0;
 public void push(int NewEntry)
 {if (StackPointer < 20)
   StackEntries[StackPointer++] = NewEntry;
 }
 Public int pop()
 {if ((StackPointer > 0) return StackEntries[--StackPointer];
 else return 0;
 }
 }
```

九、

1. (5分) What is the difference between the public and private parts of a class?
2. (5分) Describe how inheritance might be used to develop classes describing various types of building.
3. (5分) In an object-oriented programming environment, how are types and classes similar? How are they different?