

淡江大學九十四學年度轉學生招生考試試題

系別：資訊工程學系三年級 科目：資訊概論

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X	簡單型計算機

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1. Show the result of the following operations assuming that the numbers are stored in 16-bit two's complement representation. Please show the results in hexadecimal notation. (10%)

(1) $012A_h + 0E27_h$.(2) $E12A_h + 9E27_h$.

2. Suppose the procedure Modify is defined by

```
procedure Modify (Y)
```

```
  Y ← 7;
```

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

If parameters are passed by value, what will be printed when the following program segment is executed?

What if parameters are passed by reference? (10%)

```
X ← 5;
```

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

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

3. A multiprogramming operating system uses paging. The available memory is 60MB divided into 15 pages, each of 4MB. The first program needs 13MB. The second program needs 12MB. The third program needs 27MB. (15%)

(1) How many pages are used by the first program?

(2) How many pages are unused?

(3) What is the total memory wasted?

4. Using the insertion sort algorithm to sort the list, 7, 8, 26, 44, 13, 23, 98, 57, in increasing order, please show your work briefly. What is the best case for the insertion sort algorithm? What is the worst case for the insertion algorithm? (15%)

5. A binary tree has 8 nodes. Given the inorder and postorder traversal of the tree, please draw the tree.

```
Postorder: FECHGDBA.
```

```
Inorder: FECABHDG.
```

Draw a diagram showing how this binary tree appears in memory when stored without pointers using a block of contiguous memory cells. Here assume that each character is encoded by one byte. (20%)

6. Multiple-Choice Questions (10%)

(1) The digital signature method does not provide _____. (A) Privacy (B) Authentication (C) Integrity (D) Nonrepudiation.

(2) In the _____ method to synchronize the operation of the CPU with the I/O device, a large block of data can be passed from an I/O device to memory directly. (A) Programmed I/O (B) Interrupt-driven I/O (C) DMA (D) Isolated I/O.

(3) A _____ is a connecting device that acts as a protocol converter. (A) Repeater (B) Bridge (C) Router (D) Gateway.

(4) Defining the users, needs, requirements, and methods is part of the _____ phase. (A) Analysis (B) Design (C) Implementation (D) Testing.

(5) In the _____ graphic method of representing an image in a computer, the image is decomposed into a combination of curves and lines. (A) Bitmap (B) Vector (C) Quantized (D) Binary.

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7. Consider the following relations PROFESSORS, COURSES and TAUGHT-BY as shown below. Show the SQL statement that creates a new relation containing the course's CN, teaching professor's name, and the place. Please draw the ER diagram for the given relations. (20%)

Relation COURSES		
CN	Course Name	Unit
CIS15	Intro to C	5
CIS17	Intro to Java	5
CIS19	Unix	4
CIS51	Networking	5

Relation PROFESSORS		
Prof-ID	Name	Department
53-110	John	Computer
53-112	George	Computer
53-114	Rich	Computer
12-001	Ted	Math.

Relation TAUGHT-BY		
CN	Prof-ID	Place
CIS15	53-112	E480
CIS17	53-114	E690
CIS19	12-001	B931
CIS51	53-110	E225