淡江大學 95 學年度進修學士班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

准帶項目請打「V」
簡單型計算機

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本試題雙面印製

1. Represent the decimal number -25 using 8-bit by the following notation: (15%)
   (a) signed magnitude,
   (b) 2's complement, and
   (c) excess-127.

2. Represent decimal number 12.25 by using IEEE standard 754 single precision (32-bit) floating-point notation. (5%)

3. Give the full names of the following network terms (acronyms): (20%)
   (a) WWW
   (b) HTML
   (c) FTP
   (d) TCP
   (e) IP
   (f) DHCP
   (g) ARP
   (h) CGI
   (i) DNS
   (j) NAT

4. In the TCP/IP network reference model, it can be divided into five layers from layer 1, physical layer, to layer 5. (10%)
   (a) Show the other four layer's names.
   (b) Give example protocols used for each layer.

	Layer 5
	Layer 4
	Layer 3
	Layer 2
Physical	Layer 1

5. Simplify the Boolean function $F = \overline{A}\,\overline{B}\,\overline{C} + \overline{B}C\overline{D} + A\overline{B}\,\overline{C} + \overline{A}BC\overline{D}$. (10%)

6. A half adder is an arithmetic circuit that generates the sum of two binary digits. The circuit has two inputs and two outputs. We assign the symbols X and Y to the two inputs and S (for "sum") and C (for "carry") to the outputs. Design the half adder circuit using logic gates, i.e., AND, OR, NOT, XOR, etc. (10%)

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7. What will be the outputs of the following C program? (10%)

```
void foo(int a, int b)
{
    int c = a;
    a = b;
    b = c;
}

void goo(int *a, int *b)
{
    int c = *a;
    *a = *b;
    *b = c;
}

void main()
{
    int a = 3, b = 5;
    goo(&a, &b);
    printf("a = %d, b = %d\n", a, b);
    foo(a, b);
    printf("a = %d, b = %d\n", a, b);
}
```

8. In the famous Towers of Hanoi problem, show how many disk moves are needed to move *n* disks from peg-1 to peg-3 using peg-2 as the auxiliary peg. Justify your answer. (10%)

9. Give the following numbers:

   31, 25, 87, 47, 14, 69, 76, 55, 95

   Show two different methods to construct a min-heap in heap sort. (10%)