100 學年度四年制二、三年級轉學生招生考試

四技二年級　資訊工程系

第三節　專業科目(二)計算機概論　試題

注意事項：

1. 本試題共二題，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、Multiple Choice Questions (單選題) (30%)

Refer to the following declarations in C language when answering multiple choice questions 1 through 6.

```c
typedef struct {
    char    name[20];
    int     id;
    double  salary;
} emprec_t;

int main(){
    emprec_t emp1, emp2;
    char     ch1;
    int      flag1, flag2;
}
```

1. Which of the following could not be a valid statement? (5% each)

   A. `emprec_t.id = 87654;`
   B. `emp1.salary *= 1.05;`
   C. `ch1 = emp2.name[0];`
   D. `printf("%.2f", emp1.salary);`

2. Which of the following could not be a valid use of the variables shown? You may assume that `print_employee` is a user-defined function (5% each)

   A. `emp2 = emp1;`
   B. `flag1 = emp1 == emp2;`
   C. `flag2 = emp1.id == emp2.id;`
   D. `print_employee(emp1);`

3. What is the data type of the reference (5% each)

   `emp1.name[3]`

   A. double
   B. int
   C. char
   D. emprec_t

4. What is the data type of the expression (5% each)

   `emp1.salary > emp2.salary`

   A. double
   B. int
   C. char
   D. emprec_t

5. To call a user-defined function `emp_change` passing `emp1` as an output argument, one would write (5% each)

   A. `emp_change(emp1);`
   B. `emp_change(*emp1);`
   C. `emp1 = emp_change();`
   D. `emp_change(&emp1);`

6. Given this prototype of a user-defined function emp_nine, (5% each)

   `void emp_nine(int num, emprec_t *employp)`

   how would one assign the value of num to the id component of the function's output parameter?

   A. `employp.id = num;`
   B. `*employp.id = num;`
   C. `&employp.id = num;`
   D. `employp->id = num;`

二、Short-Answer Questions (簡答題) (70%)

1. For the following C codes, what is returned by function two defined below for the call two(13)? (10% each)

```
int two(int n)
{
    int ans;

    if (n == 1)
      ans = 0;
    else
      ans = 1 + two(n / 2);

    return (ans);
}
```
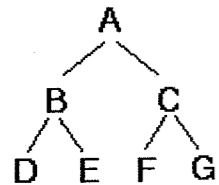
2. Translate the binary representations 0.01 into its equivalent base ten representation. (10% each)

3. For C language, what is the complement of the following expression? (10% each)

```
n || a <= b && c != 100
```

4. What sequence of nodes from the tree would be printed if the following recursive procedure were applied to it? (10% each)


```
procedure printTree (Tree)
  Stack ← empty
  if (Tree is not empty)
     then (push the current node on Stack;
             apply the procedure printTree to the right subtree of Tree)
  if (Stack is not empty)
     then (pop an entry from Stack and print that node)
```

5. If the input and output bit patterns in the circuit below are interpreted as binary representations of numeric values (except for the case of the input being 000), what operation does the circuit perform? (10% each)

Input Pattern

Output Pattern
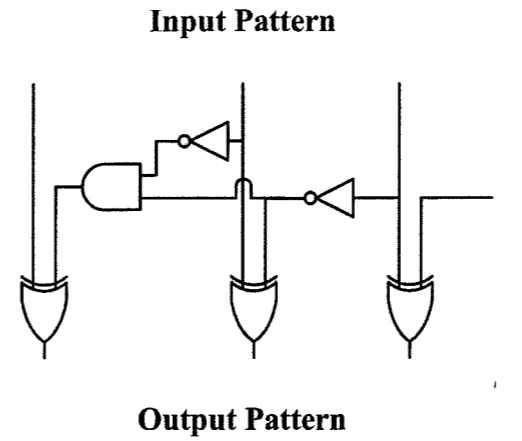
6. Given the three relations X, Y, and Z below (10% each)

X:	A	B		Y:	C	D		Z:	E	F
	7	s			t	4			2	w
	3	z			r	2			3	q
	1	u								

what values would be retrieved by executing the following statement?

```
select X.B, Y.C, Z.F
  from X, Y, Z
  where X.A > Y.D and X.A = Z.E
```

7. What is the difference between a process that is waiting as opposed to a process that is ready? (10% each)