淡江大學 97 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：程 式 語 言

可否使用計算機			
可		否	✓

本試題共 10 大題，4 頁

The following questions are related to C/C++ and Java, please print out the output.

1. (10 points)

```
#include <iostream>
using namespace std;
int main()
{
  int x = 3, y = 2;
  float z;
  z = x/y;
  cout<<"z = "<<z<<endl;
  z = x/2.0;
  cout<<"z = "<<z<<endl;
  z = (float)(x/y);
  cout<<"z = "<<z<<endl;
  z = (float)x/(float)y;
  cout<<"z = "<<z<<endl;
  z = (int)((float)x/y + 0.5);
  cout<<"z = "<<z<<endl;
  return 0;
}
```

2. Suppose the address of x is 2000, and the size of integer is 4 bytes. (10 points)

```
#include <iostream>
using namespace std;
int main()
{
  int x = 10, *ptr;
  ptr = &x;
  cout<<"ptr = "<<ptr<<endl;
  cout<<"*ptr = "<<*ptr<<endl;
  *ptr = *ptr + 1;
  cout<<"*ptr = "<<*ptr<<endl;
  cout<<"x = "<<x<<endl;
  ptr = ptr + 1;
  cout<<"ptr = "<<ptr<<endl;
  return 0;
}
```

3. (5 points)

```
#include <iostream>
using namespace std;
void PrintStar(int);
void PrintStarLine(int);
void PrintStar(int n)
{
  if (n==0) return;
  PrintStar(n-1);
  PrintStarLine(n);
  cout<<endl;
}
void PrintStarLine(int n)
{
  if (n==0) return;
  PrintStarLine(n-1);
  cout<<'*';
}
int main()
{
  PrintStar(6);
  return 0;
}
```

本試題雙面印製

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4. (5 points)

```
class Inheritance
{
   public static void main(String args[])
   {
      B objB = new B ();
   }
}
```

```
class A
{
   public A()
   {
      System.out.println("class A");
   }
}
class B extends A
{
   public B()
   {
      System.out.println("class B");
   }
}
```

5. (5 points)

```
class Inheritance
{
   public static void main(String args[])
   {
      B objB = new B ();
      objB.SetData(10);
   }
}
class A
{
   int data;
   public void SetData(int x)
   {
      data = x;
      System.out.println("data = "+data);
   }
}
```

```
class B extends A
{
   public void SetData(int x)
   {
      data = x * 10;
      System.out.println("data = "+data);
   }
}
```

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6. (10 points)

```
class Interface
{
   public static void main(String args[])
   {
      Teacher John = new Teacher ();
      Student Lee = new Student ();
      Conference C = new Conference ();
      C.Speaker(John);
      C.Speaker(Lee);
   }
}
interface Human
{
   public void Speak();
}
class Teacher implements Human
{
   public void Speak()
   {
      System.out.println("teacher");
   }
}
```

```
class Student implements Human
{
   public void Speak()
   {
      System.out.println("student");
   }
}
class Conference
{
   public void Speaker(Human s)
   {
      s.Speak();
   }
}
```

The following questions are related to general concepts in programming languages.

7. Let the function fun be defined as

```
int fun(int *k)
{
    *k = *k * 2;
    return 3 * (*k) – 1;
}
```

```
int main()
{
    int i = 10, j = 10, sum1, sum2;
    sum1 = (i / 2) + fun(&i);
    sum2 = fun(&j) + (j / 2);
    return 0;
}
```

What are the values of sum1 and sum2? (10 points, *each question is weighted 5 points*)

(a) if the operands in the expressions are evaluated left to right?

(b) if the operands in the expressions are evaluated right to left?

本試題雙面印製

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8. Consider the following program written in C syntax: (25 points, *each question is weighted 5 points*)

```
void fun(int a = 0, int b = 0)
{
    a = a + 1;
    b = b + 10;
}
```

```
int main()
{
    int x = 10;

    fun(x, x);
    printf("x = %d\n", x);
    return 0;
}
```

For each of the following parameter-passing methods, what are all of the value of x after calls to fun.

(a) pass by value (b) pass by result (c) pass by value-result (d) pass by reference (e) pass by name

9. Consider the following grammar, which of the following sentences are in the language generated by this grammar? (10 points)

S → aScB

S → A | b

A → cA | c

B → d | A

(a) abcd (b)acccbd (c)accc (d)acd (e)acccbcc

10. According to the following grammar.

<expr> -<expr> → <expr> + <term> | <term>

<term> → <term> * <factor> | <factor>

<factor> → <id> ^ <factor> | <id>

<id> → A | B | C

shows the parse tree of following expression. (10 points)

A + B ^ C ^ A * B