Computer Programming Language

【Fall Semester, 2014】

Mid-term Examination

Name：_____

ID Number：_____

Problem 1：	20 points	_____
Problem 2：	10 points	_____
Problem 3：	10 points	_____
Problem 4：	10 points	_____
Problem 5：	10 points	_____
Problem 6：	10 points	_____
Problem 7：	10 points	_____
Problem 8：	10 points	_____
Problem 9：	10 points	_____

==========

Total Points： 100 points _____

Problem 1: (20 points)

Briefly explain the following terms:

(1) pass by reference _____

_____

(2) function overload _____

_____

(3) machine language _____

_____

(4) nested loops _____

_____

(5) global variable _____

_____

(6) function prototype _____

_____

(7) syntax error _____

_____

(8) algorithm _____

_____

(9) extern _____

_____

(10) continue _____

_____

Problem 2: (10 points)

What is output by the following code segment?

```
int x;
for( x = 1; x <= 20; x++ )
{
  if( x == 12 )
    break;
  if( x == 6 )
    continue;
  cout << x <<  " ";
}
cout << endl << "The final value of x is: " << x << endl;
```

_____

Answer:

Problem 3: (10 points)

What is output by the following code segment?

```
#include <iostream>
using namespace std;
void funct1(void);
void funct2(void);
int x = 50;

void main()
{
  int x=150;
  cout << " x = " << x << endl;
  {
    int x=200;
    cout << " x = " << x << endl;
  }
  cout << " x = " << x << endl;
  funct1();
  funct2();
  funct1();
  funct2();
  cout << " x = " << ::x << endl;
}

void funct1( void )
{
  cout << " x = " << x << endl;
}
void funct2( void )
{
  static int x = 300;
  cout << " x = " << x << endl;
  x++;
  cout << " x = " << x << endl;
}
```

Answer:

Problem 4: (10 points)

What does the following code segment output?

```
int x[10] = {10,20,30,40,50,60,70,80,90,100};
int A,B,C,D,E;
A = x[2];
B = x[6];
C = x[1] + x[3] + x[5];
for( int i=0; i<10; i++ )
  if( i % 2 == 0 ) x[i]=0;
D = x[5] * x[6];
E = x[7] + x[8];
```

Answer: A = _____ B = _____ C = _____ D = _____ E = _____

Problem 5: (10 points)

Write a program that calculates and outputs the prime numbers from 2 to N. The number N is to be input by the user and the output is on the screen.

Answer: (Use the backside of this page if additional writing space is needed.)

Problem 6: (10 points)

Write a program that uses **for loops** to output the following pattern on the screen.

```
0
0 1
0 1 2
0 1 2 3
0 1 2 3 4
0 1 2 3 4 5
```

Answer: (Use the backside of this page if additional writing space is needed.)

Problem 7: (10 points)

Write a program to find the minimum ***n*** value, where ***n*** is an integer, that satisfy the following equation, and output the result to the screen.

$$4^n + 2n > 500,000$$

Answer: (Use the backside of this page if additional writing space is needed.)

Problem 8: (10 points)

The greatest common divisor (GCD) of two integers is the largest integer that evenly divides into each of the two integers. Write a function **gcd** that returns the greatest common divisor of two integers.

Answer: (Use the backside of this page if additional writing space is needed.)

Problem 9: (10 points)

Write a program that declares a 5x5 integer array and initializes it to some values of your choice. Design a function that finds the maximum value, minimum value, and average value of the 5x5 array and returns these values to the main program. The main program then displays the values returned from the called function.

Answer: (Use the backside of this page if additional writing space is needed.)