


Philadelphia University Faculty of Engineering Department of Computer Engineering		Date:- 23/05/2017 Allowed time:- 2 Hours
Programming Language (630263) Final Exam		
Student Name: -		ID: -
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Lecture Time:-	<input type="checkbox"/> 10:10-11:10 حتم	<input type="checkbox"/> 11:10-12:10 حتم
	<input type="checkbox"/> 15:10-16:10 حتم	<input type="checkbox"/> 12:10-13:10 حتم
	<input type="checkbox"/> 12:45-14:15 نر	<input type="checkbox"/> 14:15-15:45 نر

Question 1: Identify the choice that best completes the statement or answers the question.

1- Which of the following function prototypes is valid?

- a. `int funcTest(int x, int y, float z){}`
- b. `funcTest(int x, int y, float){};`
- c. `int funcTest(int, int y, float z)`
- d. `int funcTest(int, int, float);`

2- Which of the following is the "and" operator?

- a. `!`
- b. `||`
- c. `!=`
- d. `&&`

3- What is the value of `x` after the following statements execute?

```
int x = (0 <= 3 && 'A' < 'F') ? 2 : 4;
```

- a. 2
- b. 3
- c. 4
- d. 5

4- Which of the following is not a function of the `break` statement?

- a. To exit early from a loop
- b. To skip the remainder of a `switch` structure
- c. To eliminate the use of certain flag variables in a loop
- d. To ignore certain values for variables and continue with the next iteration of a loop

5- Which of the following is a selection statement in C++?

- a. `for`
- b. `switch`
- c. `do...while...do`
- d. `while`

6- Choose the invalid variable name from the below

- a. `Int`
- b. `char`
- c. `DOUBLE`
- d. `_0_`

7- How many times "hello" is get printed?

```
#include<iostream>
Using namespace std;
void main()
{
    int x;
    for(x=-1; x<=10; x++)
    {
        if(x < 5)
            continue;
        else
            break;
        cout<<"hello";
    }
}
```

- a. Infinite times
- b. 11 times
- c. 0 times
- d. 10 times

8- Suppose that `list` is an array of 10 components of type `int`. Which of the following codes correctly outputs all the last 3 elements of `list`?

- a. `for (int j = 8; j < 10; j++) cout << list[j] << " ";`
- b. `for (int j = 7; j <= 9; j++) cout << list[j] << " ";`

c. for (int j = 8; j <= 10; j++) cout << list[j] << " ";
 d. for (int j = 7; j <= 10; j++) cout << list[j] << " ";

9- Which of the following correctly declares and initializes alpha to be an array of four rows and three columns and the component type is int?

- a. int alpha[4][3] = {{0,1,2,3},{1,2,3,4},{2,3,4,5}};
- b. int alpha[3][4] = {{0,1,2,3},{1,2,3,4}{2,3,4,5}};
- c. int alpha[4][3] = {{0,1,2},{1,2,3},{2,3,4},{3,4,5}};**
- d. int alpha[3][4] = {0,1,2,1,2,3,2,3,4,3,4,5};

10- Consider the following recursive function.

```
int Fun(int num)
{
  if (num >= 10)
    return (num+2);
  else
    return (num+3);
}
```

What is the output of the following statement cout << Fun(Fun(8)) << endl;

- a. 10
- b. 11
- c. 12
- d. 13**

Question 2: Find the output of the following programs:

<pre>int n = 4, k = 2; cout << n--*++k<< endl; cout << n << endl; cout <<n/2*3+k++<< endl; cout << k << endl;</pre>	<pre>12 3 6 4</pre>
<pre>int n = 4; while (n > 1) cout << --n << endl; cout << n << endl;</pre>	<pre>3 2 1 1</pre>
<pre>int i = 5, j = 6, k = 7, n = 3; bool a=(i>5) (j>0)&&(k!=7); bool b=(n==i) (! (k==j)) cout << a <<"\n"<< b << endl;</pre>	<pre>0 1</pre>
<pre>int f = 0, c = 5; if (!f && c == 0) { cout << "true" << endl; c-=3; } else { cout<<"false"<<endl; c+=3; } cout << "c = " << c << endl;</pre>	<pre>False C = 8</pre>
<pre>const int L = 10; char m[L]={'h','e','l','l','o','w','o','r','l','d'}; for(int i=4;i<L;i+=3) cout << m[i] << endl;</pre>	<pre>O r</pre>
<pre>int fun2(int b,int c) { int y=b+c; return y; } int fun(int a, int b , int c) { int x; x=fun2(b,c); x=a/x; return x; } void main() { cout << fun(12,9,5) << endl;</pre>	<pre>0 9</pre>

<pre>cout << fun2(5,4) << endl; }</pre>	
<pre>int mod(int x,int y) { return (x%y); } void main() { for(int i=4;i<10;i+=3) cout<<mod(i,5)<<endl; }</pre>	4 2
<pre>int x = 1, y = 4; if (x >= 1) if (y <= 4) { x++; y--; } else { x--; y++; } else y+=10; cout << x << " " << y << endl;</pre>	2 3
<pre>int x=17; switch(x%7) { case 1: case 2: cout<<x%2<<endl; break; case 3: cout<<x%3<<endl; case 4: cout<<x%4<<endl; break; case 5: case 6: cout<<x%5<<endl; }</pre>	2 1
<pre>int d = 7; do { cout<<--d<<endl; }while (d>5);</pre>	6 5

Question 3: Find error(s) in the following codes

Code	Correction
<pre>int A[5]={3;5;6;4;1}; for(int i=0;i<=5;i++) { A[i]+=5; }</pre>	
<pre>char x;=? if('c'<x && x<'t') cout<<x%2<<endl; Else cout<<x%3<<endl;</pre>	
<pre>double x=1; while(x<7); { cout<<power(x,3)<<endl; x+=1; }</pre>	
<pre>int A[2][3]={{1,2,3,4},{4,1,2,3}}; for(int i=0;i<3;i++)</pre>	

<pre>for(int j=0;j<2;j++) cout<<A[i][j];</pre>	
<pre>float fun(int x) { float a=(x*5.0+3.0)/x; } void main() { cout<<fun(5,4); }</pre>	Return a;

Question 4: Perform the following tasks assume all variables are probably declared and initialized.

<p>Rewrite the following using for statements</p> <pre>int sum=0,x=1; do { sum += x*x; x++; }while(x<=5);</pre>	<pre>int sum=0,x=1; for(x=1;x<=5;x++) sum+=x*x;</pre>
<p>Rewrite the following using switch statements</p> <pre>char ch='V'; if(ch>='A' && ch<='C') cout<<"statement 1"<<endl; else if(ch=='X' ch=='Y' ch=='Z') cout<<"statement 2"<<endl; else cout<<"statement 3"<<endl;</pre>	<pre>char ch='V'; Switch(ch) { case a: case b: case c: cout<<"statement 1"<<endl; break; case x: case y: case z: cout<<"statement 2"<<endl; break; default: cout<<"statement 3"<<endl; }</pre>
<p>Define a one dimension array of type integer that contains 15 elements and initialize it using $A[i] = 3^i$ where i is the index of the element in the array.</p>	<pre>int a[15]; for(int i=0;i<15;i++) a[i]=pow(3,i);</pre>

Question 5: Write a program that perform the following tasks:

1- Define a function called calc_avg that calculate the average of three double numbers and return their average.

2- Define the following function

```
double calc_stdv(double x,double y,double z,double m)
```

that calculate and returns the sd value using the following equation.

$$sd = \sqrt{\frac{(x - m)^2 + (y - m)^2 + (z - m)^2}{3}}$$

3- Write the main function which will ask the user to enter 3 real numbers then it will call calc_avg to calculate the average of the three numbers entered by the user, then it will call the calv_stdv to calculate the standard deviation of the three numbers, then it will display the average and standard deviation on the screen.

```

#include<iostream>
#include<cmath>
using namespace std;
double calc_avg(double x,double y,double z){return (x+y+z)/3;}
double calc_stdv(double x,double y,double z,double m){return sqrt((pow((x-m),2)+pow((y-m),2)+pow((z-m),2))/3);}
int main()
{
    cout<<"enter 3 numbers"<<endl;
    double a,b,c;
    cin>>a>>b>>c;
    cout<<"The Average is "<<calc_avg(a,b,c)<<endl;
    cout<<"The standard deviation is "<<calc_stdv(a,b,c,calc_avg(a,b,c))<<endl;
}

```

Question 6: Write a program that perform the following tasks:

- 1- define a 2 dimension array of 5 rows and 6 columns.
- 2- The program should ask the user to enter the first row of the array from keyboard.
- 3- The program should initialize the remaining rows of the array using following function

$$A[\text{row}][\text{col}] = (\text{row} + 1) * A[0][\text{col}];$$

as the following:

$$\begin{bmatrix} a & b & c & d & e & f \\ 2a & 2b & 2c & 2d & 2e & 2f \\ 3a & 3b & 3c & 3d & 3e & 3f \\ 4a & 4b & 4c & 4d & 4e & 4f \\ 5a & 5b & 5c & 5d & 5e & 5f \end{bmatrix}$$

- 4- Find the average of all elements in the array.
- 5- Display the array and the average.

```

int main()
{
    int A[5][6];
    int sum=0;
    cout<<"Please enter 6 numbers"<<endl;
    for(int col=0;col<6;col++)
    {
        cin>>A[0][col];
        sum+=A[0][col];
    }
    for(int row=1;row<5;row++)
        for(int col=0;col<6;col++)
        {
            A[row][col]=(row+1)*A[0][col];
            sum+=A[row][col];
        }
    sum/=5*6;
    for(int row=0;row<5;row++)
    {
        for(int col=0;col<6;col++)
            cout<<A[row][col]<<" ";
        cout<<endl;
    }
    cout<<sum<<endl;

    cout<<endl;
}

```