Benha University Faculty of Engineering (at Shoubra) Energy & Sustainable Energy Eng. Dep. Level "0" Spring Semester Attempt ***all*** the following questions:		**Final Exam** **Subject:** Computer Programming – CPE 101 **Date:** Sunday 15/05/2016 **Duration:** 3 hours **№ of Questions:** 5 in 3 page(s) **Total Mark:** 40

Question 1: (12 Marks)

A. Determine the output for each of the following code snippets (assuming successful compilation): (8 Marks)

a) (2 Mark)

```
# include <iostream>
void draw_line ( void ) ;
void main ( ) {
draw_line();
cout << "Welcome "<< endl;
draw_line ( ) ;
cout << " First Year " ;
draw_line ( ) ;
}
void draw_line ( void ) {
for ( int i = 0 ; i < 4 ; i ++ ) {
cout << " * " ; }
cout << endl ; }
```

b) (2 Mark)

```
# include <iostream>
int number = 1 ;
void display (void);
void main ( ) {
int number = 2;
cout << " The value of the number is " <<
number << endl ;
display ( ) ;
}
void display ( void ) {
cout << " The value of the number now is "
<< number ;
}
```

c) (2 Mark)

```
#include <iostream>
int boxVolume ( int length = 10, int width =
10, int height = 20 );

int main( ) {
cout << "The default box volume is: " <<
boxVolume( 10,1,1 );
return 0;
}
int boxVolume ( int length, int width, int
height )
{
return length * width * height;
}
```

d) (2 Mark)

```
#include <iostream>
int main ( ) {

int f1 = 1;
int f2 = 1;
    for (int i = 1; i <= 5; i += 1) {
        cout << f1 << endl;
        f2 = f1 + f2;
        f1 = f2 - f1;
    }
}
```

B. Write for loops that will print the following patterns: (4 Marks)

a) (2 Mark)

```
*****
*****
*****
*****
*****
```

b) (2 Mark)

```
1
2 2
3 3 3
4 4 4 4
```

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Answer:

A.

a) (2 Mark)	b) (2 Mark)
* * * * Welcome * * * * First Year * * * *	The value of the number is 2 The value of the number now is 1
c) (2 Mark)	**d) (2 Mark)**
The default box volume is: 10	1 1 2 3 5

B.

e) (2 Mark)	f) (2 Mark)

#include <iostream>
int main( ) {
for (int i = 1; i<=5; i++) {
for(int j=1; j<=5; j++) {
 	
cout<<"*";
}
cout<<endl;
}
return 0;
}
	#include <iostream>
	int main( ) {
	for (int i = 1; i<=4; i++) {
	for(int j=1; j<=i; j++) {
	
	cout<<i;
	}
	cout<<endl;
	}
	return 0;
	}

Question 2: (7 Marks)

1. The purpose of using a loop is to……

a. repeat operation(s) many times
c. make decision
b. declare variables
d. declare constants

2. Which of the following is not a comparison operator in C++ language?

a. >
c. <=
b. =
d. = =

3. Which of the following is not a standard data type?

a. int
c. char
b. date
d. float

4. The force of gravitational attraction (F) of two bodies is given by a formula in which a constant (G) is multiplied by the product of the two masses (m1 and m2). This is then divided by the square of the distance (d) between the two bodies. Assuming these variables are declared, and have proper initial values where necessary, which of the following C++ statements correctly expresses this formula?

a. G*m1*m2/d*d
c. F = = G*m1*m2/d^2;
b. F = G*m1*m2/(d*d);
d. a or c is correct

5. char a='b'; char b='c'; char c=a; cout<<"a"< <b<<"c" <<a<<"b"<<c;
The output of this program segment is:

a. accabb
c. abcabc
b. accbbb
d. None of the above

6. Which of the following is a correct declaration to a constant:

a. float Y 3.14;
c. const float Y = 3.14;
b. # define Y = 3.14;
d. None of them

7. Which of the following is a correct comment:

a. None of them
c. /* This is a comment /*
b. /// This is a comment //
d. // This is a comment

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Question 3: (7 Marks)

Book Club Points

A Bookseller has a book club that awards points to its customers based on the number of books purchased each month. The points are awarded as follows:

- If a customer purchases 0 books, he earns 0 points.
- If a customer purchases 1 book, he earns 5 points.
- If a customer purchases 2 books, he earns 15 points.
- If a customer purchases 3 or more books, he earns 30 points.

Design a program that asks the user to enter the number of books that he or she has purchased this month and displays the number of points awarded.

Answer:

```
#include <iostream>
int main( ) {
int book, earn;
cout<<"Please enter the number of books";
cin>>book;
if (book==0)
earn = 0;
else if (book == 1)
earn = 5;
else if (book == 2)
earn = 15;
else if (book >= 3)
earn = 30;
cout<<"The number of point awarded:"<<earn;
return 0;
}
```

Question 4: (7 Marks)

Write a complete C++ program that repeats printing a specific character according to a specific number. The program should ask the user to enter a character and a number. The program should then display the character many times as the number.

[For example, if the user enters "$" and "5", the program should display "$$$$$"].

Answer:

```
#include <iostream>
int main( ) {
int N;
char ch;
cout<<"Enter the number:";
cin>>N;
cout<<"Enter the charcter";
cin>>ch;
for(int i = 1; i<=N;i++)
        cout<<ch;;
        return 0;
}
```

Question 5: (7 Marks)

A. Write a complete C++ program that swap the integer values of two variables. The program should ask the user to enter two integer numbers, then use a function called *Swap* that swap the two values and print them after swapping. (5 Marks)

Answer:

```
#include <iostream>
void Swap (int N1, int N2);
int main(int argc, char** argv) {
int N1,N2;
cin>>N1;
cin>>N2;
Swap(N1,N2);
return 0;
}
void Swap (int N1, int N2){
        int Temp;
        Temp = N1;
        N1 = N2;
        N2 = Temp;
        cout<< "The value after swaping"<<N1<<" "<<N2;
}
```

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B. Complete the following sentences: (2 Marks)

1. Any C++ program has at least **one** function(s)**.**
2. The value of the following expression: sqrt (sqrt (81)) is **3.**
3. The value of the following expression: power (2, 3) is **8.**
4. The basic mathematical functions can be used in any C++ program by including a library called **cmath.**

Good Luck
Dr.Shady Yehia Elmashad