

UNITY UNIVERSITY, ADAMA CAMPUS
DEPARTMENT OF COMPUTER SCIENCE

NAME:_____

IDNo:_____ **DEPARTMENT:**_____

COURSE TITLE	BASIC COMPUTER PROGRAMMING
COURSE CODE	COSC 1012
Max. Point	50
Max. Time Allotted	2:00 hrs

Part One: Read the following questions carefully and give short and precise answer for each of the following questions inside the free spaces provided under each (15 Pts).

1. What is Computer? And consider your previous knowledge and list down the areas of application of computer (1 pts).

2. Versatile is one of the important properties or characteristics of computers. Explain this properties and put your justification either it is hardware or software to make the computer is versatile (1 pts).

3. Explain why computer is **automatic** machine (1 pts).

4. List down the major components of a computer system (1 pts)

5. What part of the computer actually runs programs (0.5 pts).

6. What part of the computer serves as a work area to store a program and its data while the program is running (1 pts).

7. What fundamental set of programs control the internal operations of the computer's hardware (1 pts).

8. What do you call a program that performs a specialized task, such as a virus scanner, a file compression program, or a data backup program (1 pts).

9. Word processing programs, spreadsheet programs, email programs, web browsers, and game programs belong to what category of software (1 pts).

10. What amount of memory is enough to store a letter of the alphabet or a small number (0.5 pts).

11. What encoding scheme is extensive enough to represent the characters of many of the languages in the world (1 pts).

12. List down and explain about the three levels of programming languages (1 pts).

13. What type of programming language allows you to create powerful and complex programs without knowing how the CPU works (1 pts).

14. Each language has a set of rules that must be strictly followed when writing a program. What is this set of rules called (1 pts).

15. What do you call a program that translates a high-level language program into a separate machine language program (1 pts).

16. What do you call a program that both translates and executes the instructions in a high-level language program (1 pts).

Part Two: Read the C++ code written under each of the following questions carefully and identify the syntax errors you observed. Write your answers inside the box provided under each questions (10 Pts).

17. Read the following C++ code carefully and identify the syntax error you observed and the statement that makes the program correct side by side inside the box below shortly and precisely (5 Pts).

```
#include <iostream>
using namespace std;
main(){
program to calculate Area of a Circle
float area;
cout<<"Enter the radius of a circle";
cin>>r;
area=(r*r)*3.14156;
cout<<"Area="<<<<endl;
float w, h, rectarea;
cout<<"Enter the width of the rectangle"
cin>>w
cout<<"Enter the height of the rectangle";
cin>>h;
rectarea=(w*h);
cout<<"Area="<<rectarea;
cout<<"Enter the width of the triangle";
cin>>width;
cout<<"Enter the height of the triangle";
cin>>height;
trigarea=(width*height)*0.5;
cout<<"area="<<trigarea;
return 0;
}
```

Syntax Errors

18. Observe the following simple C++ program and identify the syntax errors of the program that violates the correct program writing (5 Pts).

```
include<iostream> {  
using namespace std;  
  
k=5;  
k=++k+10;  
cout<<"K="<<k<<endl;  
k=5  
k=k++ +10;  
cout<<"K="<<k<<endl;  
k=5;  
k=--k+10;  
cout<<"k="<<k<<endl;  
k=5;  
k=k-- +10;  
<<"K="<<k;  
}
```

Syntax Errors

Part Three: Read the following C++ program under each of the following questions carefully and determine the output of the program you expect and write your answers inside the box provided under each questions (10 pts).

19. Read the following C++ code carefully line by line and determine the output of the program you expect and write your answer inside the box below (5 Pts).

```
#include<iostream>  
using namespace std;  
int main(){  
//C++ program to demonstrate Arithmetic Operators  
cout<<" C++ *****Program"<<endl;  
cout<<" C++*****Arithmetic Operators"<<endl<<endl;  
    int x, y;  
    //Assign values to x and y variables  
    x=120;
```

```

y=40;

cout<<"Sum="<<(x+y)<<endl;
cout<<"Difference="<<(x-y)<<endl;
cout<<"Product="<<(x*y)<<endl;
cout<<"Division="<<(x/y)<<endl;
cout<<"Modulus="<<(x%y)<<endl;

cout<<"C++*****Program"<<endl;
cout<<"*****Relational Operators"<<endl<<endl;
//C++ program to demonstrate Relational or Equality Operator
int num=15;

cout<<"num<10 is "<<" "<<(num<10)<<endl;
cout<<"num>10 is "<<" "<<(num>10)<<endl;
cout<<"num==10 is "<<" "<<(num==10)<<endl;
cout<<"num==20 is "<<" "<<(num==20)<<endl;
cout<<"num!=20 is "<<" "<<(num!=20)<<endl;
cout<<"num>=20 is "<<" "<<(num>=20)<<endl;
cout<<"num<=20 is "<<" "<<(num<=20)<<endl<<endl;
cout<<"*****Implement Casting *****"<<endl;

    int cost=200;
    int volume=800;
    double up;
    up=cost/(double)volume;
    cout<<"Unit Price="<<up<<endl;

cout<<"Characters are Valid ***** Operands"<<endl;
cout<<"(Y less than Z) in ASCII Code*****"<<endl;
char var1='Y';
char var2='Z';

//Y is less than Z because in ASCII code
cout<<"Y less than Z is:"<<(var1<var2)<<endl;

int m, n;
m=111;
n=++m;//Pre-increment Operator is applied in m

```

```

cout<<"m="<<m<<" "<<"n="<<n<<endl;
n=m++;//Post-increment ia applied in m;
cout<<"m="<<m<<" "<<"n="<<n<<endl;
n--m;//Pre-decrement operator is applied on m
cout<<"m="<<m<<" "<<"n="<<n<<endl;
n=m--;//Post decrement is applied on m
cout<<"m="<<m<<" "<<"n="<<n<<endl;
cout<<"*****"<<endl;
int k=20;
k=++k +10;//Pre-increment Operator applied on k
cout<<"K="<<k<<endl;
k=5;
//int a;
k=k++ +10;//Post Increment is applied on k
cout<<"K="<<k<<endl;
k=5;
k=k-- +10;//Pre-decrement is made on K
cout<<"K="<<k<<endl;
k=5;
k=k-- +10;//Post-decrement operator is applied on k
cout<<"K="<<k<<endl<<endl;

```

Output

```

cout<<"*****C++ Program to Demonstrate"<<endl;
cout<<"*****Assignment Operator d/t Characters"<<endl;

```

```

int z;
z=25;
z+=25;//z=(z+25)
cout<<"Z="<<z<<endl;
z-=25;//z=(z-25)
cout<<"Z="<<z<<endl;
z*=25;//(z=z*25)
cout<<"Z="<<z<<endl;
z%=25;//z=z%25)

```

Output

```

cout<<"Z="<<z<<endl;
z/=25;//z=z/25
cout<<"Z="<<z<<endl;
    return 0;
}

```

20. Read the following C++ program carefully line by line and determine the output of the program you expect and write your answer inside the space provided under the question (5 Pts).

```

#include<iostream>
using namespace std;
int main () {
//Declaration of Variables
bool b,n;
b=10;
n=20;
//Test the condition
if(b==n){
cout<<"This is executed."<<endl;
}
else {
cout<<"This is not executed."<<endl;
}
cout<<"b>n is "<<(b>n)<<endl;
cout<<"b<n is "<<(b<n)<<endl<<endl;
//Declaration of variables
int x, y,z;
x=30;
y=40;
z=(x+y);
cout<<"X="<<x<<" "<<"Y="<<y<<" "<<"Z="<<z<<endl;
cout<<"WELCOME TO UNITY UNIVERSITY"<<endl;
cout<<"Department of Computer Science"<<endl;

```

Output


```

int w=40;
cout<<"W="<<w<<endl;
cout<<"***GOOD LUCK!***"<<endl;
cout<<"***END OF PROGRAM***"<<endl<<endl;
cout<<"The size of an int is:\t\t"<<sizeof(int)<<" "<<"bytes"<<endl;
cout<<"The size of a short int is:\t"<<sizeof(short)<<" "<<"bytes"<<endl;
cout<<"The size of char is:\t\t"<<sizeof(char)<<" "<<"bytes"<<endl;

return 0;
}

```

Part Four: Write C++ program based on the information given to you for the following questions. Make your writing neat and provides comment if it is possible to make the program more readable. Use the attached blank paper for your answers (15 Pts).

21. Write C++ program to accept variables of three inputs and displays the inputs of the program as an output (2 Pts).
22. Write C++ program to display the following output using char data type and character strings in one program (3 Pts).

C D E F

I Love ETHIOPIA!

23. Write algorithm expression or pseudo code program and C++ program for the following mathematical expression (4 Pts).

A) $\frac{x+y}{z} - \frac{x-y}{z-x}$

B) $x = \sqrt{a^2 + b^2}$

C) $\frac{p-q}{r-s} + m*n$

D) $F = (9/5 * C) + 32$

24. Write C++ program to display the following output after running (2 Pts).

O B A M A

Welcome To C++ Programming Language mid- Exam

You will be the best COMPUTER SCIENCE man

If you are good in Programming

Please try to work hard being you are the best and competent in IT market

25. Observe the following mathematical expression information and analyze, write its pseudo code program and C++ code to perform the required operation. The perimeter P and Area of a triangle whose sides have lengths a, b and c are given by (4 Pts).

$$P = a + b + c$$
$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

Where $s = (a+b+c)/2$.