



ZIMBABWE

**MINISTRY OF HIGHER AND TERTIARY EDUCATION,
SCIENCE AND TECHNOLOGY DEVELOPMENT**

**HIGHER EDUCATION EXAMINATIONS COUNCIL
(HEXCO)**

NATIONAL CERTIFICATE

IN

INFORMATION TECHNOLOGY

SUBJECT: Programming Using C++ (Theory)

PAPER NO: 317/13/S02A

DURATION : 3 Hours

OCTOBER/NOVEMBER 2014 EXAMINATION

REQUIREMENTS

INSTRUCTIONS TO CANDIDATE

Answer ALL Questions

This paper consists of 4 printed pages.

QUESTION 1

- a) Classify the following as valid or invalid variables by means of a table and give a brief explanation to justify your assumption.

- i) Char
- ii) GOTO
- iii) width
- iv) class1
- v) friend_

(10 marks)

- b) Define the following terms as they are used in c++ programming:-

- i) Variable
- ii) Identifier
- iii) pseudocode
- iv) Flowchart
- v) Algorithm

(10 marks)

QUESTION 2

Assuming that all pre-processor directives have been embedded determine the exact output of the code segments below:

```
a) int main() {  
    int i1 = 2, i2 = 4;  
    double d1 = 2.5, d2 = 5.0;  
    cout<< fixed << setprecision(1);  
    cout<<i1<<" "<<i2<<"=" <<i1+i2 <<endl;  
    cout<< d1<<" "<< d2<<"=" << d1+d2<<endl;  
    cout<<i1<<" "<<d2<<"=" << ++i1+d2<<endl;  
    --i1;  
    cout<< i1<<"-"<<i2<<"=" <<i-++i2<<endl;  
    --i2;  
    cout<<d1< "-"<<d2<<"=" <<d1-d2<<endl;  
    cout<<i1<<"-"<<d2<<"=" <<i1-d2<<endl;  
    cout<<i1<<"*"<<i2<< "=" <<i1*i2< endl;  
    cout<<d1<<"*"<<d2<<"=" <<d*d1<<endl;  
    cout<<i1<<"*"<<d2<<"=" <<i1*d2<<endl;  
    cout<<d1<< "/"<<d2<<"=" <<d1/d2<<endl;  
    cout<<i1<< "/"<<d2<<"=" <<i1/d2<<endl;  
    return 0;  
}
```

(11 marks)

b)

```
int main()
{
    int x=10,y=20;
    Y+=++x; ++y, x++
    X+=y++;
    cout <<" x = " <<x<<"\n"<<" y ="<<y;
    return 0;

}
```

Handwritten:
 $x = 10, y = 21$
 $x = 11, y = 22$

(4 marks)

c)

```
int main(){
    float x=2;
    float y=2 *pow(x,2)-1;
    float z=2* pow(x-1,2);
    ++z,y--;
    cout <<"x="<<"\t"<<"y="<<y<<"\t"<<"z ="<<z;
    return 0; }
```

(5 marks)

QUESTION 3

- a) Fill in all blank space in the table below with appropriate output for the given values below.

value	ceil	trunc
2.3		
3.8		
-2.3		
-3.8		

(8 marks)

- b) Rewrite the mathematical statements below in a c++ language format.

i)
$$y = \frac{1+2a}{3} + \frac{4(b+c)(5-d-e)}{f} - 6\left(\frac{7}{g} + h\right)$$

(8 marks)

ii)
$$x = \frac{-b - \sqrt{b^2 - 4ac}}{\sqrt{2a}}$$

(4 marks)

QUESTION 4

Write pseudo code and draw a flowchart to sum all the even numbers between 1 and 20 inclusive and then display the sum.

(20 marks)

QUESTION 5

- a) With aid of an example outline five rules for forming a valid c++ identifier.
(10 marks)
- b) Explain in detail the effect of the following c++ statements when working with files
- i) `theinputfile.open("testfileio.dat ");`
 - ii) `theinputfile.open("testfileio.dat ", ios::in | ios::binary);`
 - iii) `myfile.open("example.bin",ios::out | ios::app | ios::binary);`
 - iv) `theoutputfile.open("testfileio.dat",ios::out | ios::binary;`
 - v) `theoutputfile.open("testfileio.dat",ios::out | ios::app);`
- (10 marks)

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