2920/203
OBJECT ORIENTED PROGRAMMING
July 2019
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

MODULE II

OBJECT ORIENTED PROGRAMMING

3 hours

INSTRUCTIONS TO THE CANDIDATE:

*This paper consists of **EIGHT** questions.*
*Answer **FIVE** of the **EIGHT** questions in the answer booklet provided.*
ALL questions carry equal marks.
Candidates should answer the questions in English.

This paper consists of 5 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

Turn over

1. (a) Define each of the following terms as used in Object Oriented Programming:

(i) Object;

(ii) Variable. (4 marks)

(b) Differentiate between *token* and *identifier* as used in programming. (4 marks)

(c) Determine the output of the following C++ statements:

```
char c = 'A';
short m = 26;
int n = c+m;
Cout<<" n"
```
(2 marks)

(d) (i) With the aid of C++ syntax code explain *instance variable*. (4 marks)

(ii) Johan designed an object-oriented program, the program failed to compile due to incorrect identifier declarations. Explain **three** rules he should have followed. (6 marks)

2. (a) Identify the type of error that will be generated in each of the following cases:

(i) Division by a variable that contains a value of zero;

(ii) Multiplication operator used for division;

(iii) Missing semicolon. (3 marks)

(b) (i) Explain **two** types of class access specifiers in C++. (4 marks)

(ii) Write a C++ expression for the following mathematical equations:

$(z = x^3 + y^3 - xy / z)$ (3 marks)

(c) Distinguish between *boolean* and *character* literals as used in programming. (4 marks)

(d) Explain **three** error handling techniques used in C++. (6 marks)

3. (a) Outline **two** advantages of using functions in Object Oriented Programming. (2 marks)

(b) State **two** differences between *static* and *non-static* data members. (4 marks)

(c) The following is a C++ program segment. Use it to answer the questions that follow:

```
String.x="Information";
String.y="Communication".
```

Determine the out generated by each of the following functions:

(i) Cout << "x+y)";

(ii) Cout<< "(x.length ())";

(iii) Cout<< "(x.equals (y))"; (6 marks)

(d) (i) Define an *impure* function. (2 marks)

(ii) With the aid of syntax code explain how the member functions can be accessed using pointers. (6 marks)

4. (a) Explain *local variable* as used in object oriented programming. (2 marks)

(b) Distinguish between *encapsulation* and *abstraction* as used in C++. (4 marks)

(c) With the aid of a Syntax code explain inline function. (4 marks)

(d) (i) Define the term *enumerated datatype*. (2 marks)

(ii) Write a program in C++ that would initialize the values (20 50 40 10 30) into an array. The program then displays the sum, maximum and minimum of the values. (8 marks)

5. (a) Outline **four** characteristics of constructors as used in Object Oriented Programming. (4 marks)

(b) With the aid of a syntax code explain copy constructor. (4 marks)

(c) A C++ class has the name student with the following attributes:

Roll number: 5
Total Marks: 430
Age: 16

Write a C++ program to declare the class. (6 marks)

(d) The following code was written by a student. Use it to answer the questions that follow.

```
If(hours=40)
{
Cout<<"Full time";
}
Else if(hours<40)
{
Cout<<"Part time"
}
Else
{
Cout<<"Overtime due";
}
```

(i) Identify **three** bugs in the code. (3 marks)

(ii) Re-write the code correctly . (3 marks)

6. (a) Outline **three** differences between *overloading* and *overriding* as used in object oriented programming. (6 marks)

(b) Explain the term *compile time polymorphism*. (2 marks)

(c) (i) Distinguish between *ifstream* and *ofstream* file operations. (4 marks)

(ii) Write a program in C++ to prompt a user to enter a figure (either a Circle or a Rectangle). The program then computes the area of the figure entered through a function and displays the result. (8 marks)

7. (a) Define each of the following terms as used in Object Oriented Programming:

(i) virtual function;

(ii) abstract class. (4 marks)

(b) Explain the term *object slicing* as applied in inheritance. (2 marks)

(c) Table 1 shows the criteria used to award bursaries to applicants .Use it to answer the question that follows.

Credit score	Amount
3	15,000
2	10,000
1	5,000
0	0

Table 1

Write a program in C++ that would prompt a user to enter the credit score of an applicant. The program then outputs the amount. Use case statement. (7 marks)

(d) Figure 1 shows a type of inheritance in C++. Use it to answer the questions that follow.

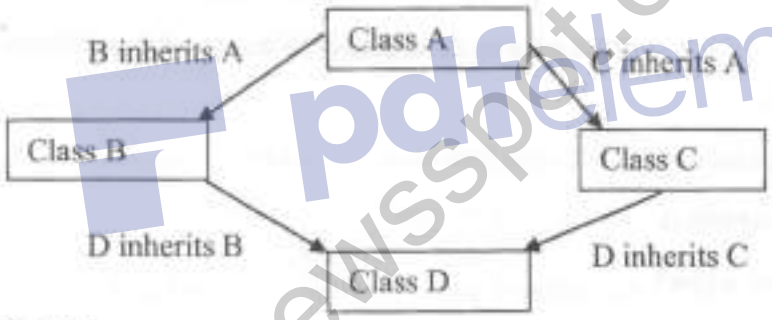

Figure 1

(i) Identify the type of inheritance depicted in the figure. (1 mark)

(ii) Describe the problem associated with this type of inheritance. (2 marks)

(iii) Explain **two** mechanisms that could be used to solve the problem in (ii) (4 marks)

8. (a) Explain **two** types of exceptions in Object Oriented Programming. (4 marks)

(b) Describe *namespace* as used in C++ programming language. (2 marks)

(c) With the aid of a syntax code, explain the use of *break* and *continue* statements. (6 marks)

(d) Write a program in C++ to accept a string through the keyboard and store it in a file. (8 marks)

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