1. A student wrote the following program to compute the perimeter of a rectangle. However, the program has errors. Give <u>five</u> programming errors (state the line number and the error).   **(5 Marks)**

```
// Program to input length and width of a rectangle,
and then compute the perimeter.
#Include <iostream.h>
void main()
{
    long length, width, perimeter;
    cout<<"\nInput length,width ";cin>>length>>width;
    Perimeter=2*length+width;
    cout<<"\nThe perimeter is "; cout>>perimeter;
    return(0);
};
```

2. (a) (i) What does the following C++ statement do?   m+=n;   **(1 Mark)**
        (ii) Which C++ data type represents integers of larger capacity than int?
                                                                 (1 Mark)

    (b) (i) What is another name of a static data member?   **(1 Mark)**
        (ii) What is another name of a base class?   **(1 Mark)**

    (c) Which C++ keyword is a pointer to the current object?   **(1 Mark)**

3. (a) State one major similarity and one major difference between a private member and a protected member.   **(2 Marks)**

    (b) Which form of inheritance is represented by the code sketched below?
```
class myclass_m: myclass   {   ...   }
class myclass_n: myclass_m{   ...   }
```
                                                                 (2 Marks)

    (c) What is an abstract class?   **(1 Mark)**

4. The details stored for a member of staff at the university include the name (for all staff), the salary (for all staff), and the number of units taught (only for lecturers). Two operations performed include computing the tax paid (as 30% of the salary), and computing the part time teaching pay (as 80,000 per unit – for units taught above the normal workload of 3, and only for lecturers).
    Required:
    (a) Draw <u>class diagrams</u> to show how you will design the solution by applying inheritance to have classes **lecturer** and **staff**. Each class should have a <u>parameterized constructor</u>.   **(4 Marks)**
    (b) Write C++ <u>classes</u> to implement this.   **(11 Marks)**

- E N D -

1. (a) Which C++ data type represents the following values?
        boolean data type → (i) True or False   (ii) Positive integers *Int data type* (2 Marks)
    (b) Which C++ operator is used as the;
        (i) "Equal to" operator (ii) Negation (or "Not") operator (2 Marks)
    (c) Write a C++ statement to copy the value of variable **x** into variable **y**.
                                                                (1 Mark)

2. A student wrote the following program to input two numbers that can have decimal points and output their sum. However, the program has errors. Give five syntax errors (state the line number and the error).   (5 Marks)

```
/* Program to compute sum of numbers /*
#include <iostream.h>
int main();
{
    Double x, y, result;
    cout<<"\nInput two numbers "; cin>>x>>y;
    result=x+y;
    cout<<"\nThe result is ",result;
{
```

3. Assume the following sketch of a C++ function.

```
char x(float numb1, int numb2)
{ ... }
```

    Required
    (a) In functions terminology, what name do we give the section;
        (i) **char**   (ii) **numb1** and **numb2**   (2 Marks)
    (b) Write sample statement(s) to call the function.   (2 Marks)

4. (a) What is another name of a member function?   (1 Mark)
    (b) What is another name of a member function's declaration?   (1 Mark)
    (c) Which C++ operator/keyword is used;
        (i) As the "address of" operator.
        (ii) In defining a member function outside the class.   (2 Marks)

5. The details stored for a student include the name and the marks for three subjects taken. The two operations done on any student are returning the mean mark, and computing (and outputting) the comment based on the mean mark i.e. either "Very good" (if the mean is at least 80), or "Good" (if the mean is at least 60), or otherwise "Fair".
    Required: Write a C++ program with a class named **student** for this problem. The class should also have a parameterized constructor. Also, all functions should be defined outside the classes. Include also declaring an array of 100 objects and calling their operations using a loop. (12 Marks)

- END -

pointer ②

UNIVERSITY OF ELDORET

<u>28-November-2019</u>   **COM 213 CAT 2**   **Time: 1 Hour**

1. (a) What is another name of a function's declaration?   **(1 Mark)**

    Proto type

    (b) Which C++ operator is used in;
       (i) Calling a method using a pointer. →   **(1 Mark)**
       (ii) Defining a method outside the class. : :   **(1 Mark)**

2. (a) Assume a class named **k** with one data member of Boolean type
        named **p**. Write a C++ <u>statement</u> to declare a parameterized
        constructor of the class.   **(1 Mark)**

    (b) Which form of inheritance is represented by the C++ code
        sketched below?

```
class myclass_m: myclass
{   ...   }
class myclass_n: myclass_m
{   ...   }
```
        Multi level
          (1 Mark)

    (c) Assume you find the following function inside a class. What name
        is given to such a function?

```
virtual int y()=0;
```
        Pure virtual function   **(1 Mark)**

3. The details stored for an electronic item in a retail shop include its
    name, discount rate, price, and quantity sold. Two operations done
    are computing the amount sold (i.e. product of price and quantity),
    computing the discount given (discount is given only if quantity sold
    is at least 3), and outputting the details appropriately. The details
    stored for all other types of items in the shop include an item's name,
    price, and quantity sold. Two operations done are computing the
    amount sold (i.e. product of price and quantity), and outputting the
    details appropriately.

    Required:
    (a) Draw <u>class diagrams</u> to show how you will implement the solution
        by applying inheritance. Each class should have a default
        constructor.   **(4 Marks)**
    (b) Write C++ <u>classes</u> to implement this.   **(10 Marks)**

                        - E N D -