Instructions: While answering programming questions, students are instructed to write the main method also.

Answer all the questions

Q. No	QUESTION	Marks
1	Ashish, an animation designer, is in need of storing positional information as well as colour information of a point in 2D space. Let x, y represent the positional and R, G, B represent the colour information respectively for a structure named **PixelPoint**. Note: Each colour code (R,G,B) in the computer system is represented between the values 0 to 255. Help your client in implementing the above using structure concept in the C language to initialize and display the details of couple of pixel points using appropriate functions.	10
2	Create a class *Saving_Account* with members as Account_number, saving_balance and Account_holder_name. Create parametrized constructor with in the class to initialize the data members. Create member functions for deposit(), withdraw(), interest(), penalty() and show(). The Interest is calculated as *sav_bal*0.2*. Write the C++ code in order to achieve the following tasks with sample input and output as reference: • Accept deposit and withdrawal amount from a customer and update balance • Display the account details and interest as shown below • Check for the minimum balance, impose penalty (Rs 20 needs to deducted if minimum balance<500).	10
3	a). Compare and contrast *procedural programming* with *object-oriented programming* language in detail. [5 marks] b). Differentiate between *static* and *non-static* data members of a class with suitable example. [5 marks]	10
4	Write a C++ program to display the electricity bill of the consumers using multiple inheritance. Create a class *Consumer* with protected fields as customer_number, name, and address. Provide member function called welcome() for displaying the welcome message, getdata() function for taking the customer_number, name, address and putdata() function for displaying the above fields. Create another class *Meter* with protected fields as start_meter_reading, last_meter_reading. Provide member function called input() for taking the meter readings and function called display() to display the same.	10

Sample Input	Sample Output
Accout No.1001 Name :Nani Balance :20000 Enter Deposit Amount =10000 Enter Withdraw Amount =1000	Account No: 1001 Name: Nani Balance: 29000 Interest = 580 No penalty

Create a derived class *Electricity_bill* from the base class *Consumer* and *Meter*. Create one member function in the same class to calculate total electricity bill. Use the table below and below formula

total_bill = bill + (bill*vat)

unit= last_meter_reading - start_meter_reading.

bill= unit*rate

unit	rate/Unit	vat
<100	2.84	12%
100-200	3.10	14%
>200	4.10	16%

Sample Input	**Sample Output**
Welcome to the Electricity Consumer information system ..... Enter the Customer No: 1001 Enter the Customer Name : Jony Enter the Customer Address: Plot 42, Vellore Enter the Starting meter reading: 200 Enter the Ending meter reading: 550	The customer No: 1001 The customer Name: Jony The customer address: Plot 42, Vellore Starting meter reading=200 Ending meter reading=550 Total unit consumed=350 Total bill=1664.6

5 Given below a code to calculate area of rectangle through inheritance. Using the derived class calculate the area. Complete and fix the bugs, if any. Keep relevant comments to justify the errors identified. Explain the features involved in the code — 10

```
#include<iostream>
----------// Fix me
class Rectangle
{
   private:
     float length ;
   public:
     float breadth ;
     void Enter_lb(void)
     {
          ----------/Fix me ---------- }
     float get_l(void)
     {    ...../Fix me ..... }
};
class Rectangle1 : public Rectangle
{
   private:
     float area ;
   public:
     void Rec_area(void)
     { area = length * breadth ; }
void Display(void)
   {
    --------//Fix me ----------    }
}; // End of the derived class definition
int main()
{    Rectangle1 r1 ;
     r1.Enter_lb( );
     r1.Rec_area( );
     r1.Display( );
     return 0; }
```