Answer all questions   Time: Two hours

Question 1.
Define the class student with the following specification:

Private members of class student : Admno integer,
sname 20 characters, eng, math, science float,
Total float, ctotal() a function to calculate eng + math+ science
with float return type.

Public member functions of class student : Takedata () function to accept values for admno,
sname, eng, math, science and invoke ctotal() to calculate total.
Showdata() function to display all the data members on the screen.

Question 2.

Imagine a publishing company that markets both books and audio-cassette versions of its
works .
(i)
Create a class publication that stores the title(a string)
and price (type float) of a publication. From this class
derive two classes : book , which adds a page count
(type int), and tape, which adds a playing time in minutes (type float). Each of these three
classes should have a getdata() function to get its data from the user at the keyboard,and a
putdata() function to display its data .
(ii)
Write a main() program to test the book and tape classes by
creating instances of them,asking the user to fill in their data with
getdata(),and then displaying the data with putdata().

Question 3.

Design and implement an object class *Complex* with the fallowing :
 Private data members
   Two real numbers to hold values for real and imaginary parts.

Public member function.
   A suitable constructor.
   e.g. *Complex* $C_1(5,6)$, to construct C_1 as 5 +6i.
      Complex $C_2(5)$, to construct C_2 as 5 +0i.
   Overloaded operator '+' to return the addition with another complex number.
   e.g. $C_1 + C_2$ return 10 + 6i.
   Overloaded operator '+ =' to return the addition with another
    complex number and then assign the result to itself.
   e.g. $C_1 += C_2$ return 10 + 6i and also C_1 is changed to 10+6i.
   Friend function.
   Overloaded operator '<<' to display a complex number in X +iY format.
   e.g. cout '<<' C_1 displays 5+6i.
   Non Member function.
   Overloaded operator '+' to add it with a real number .
   e.g. 5+C_1 returns 10+6i.

Question 4

   Defina a classs string that could work as a user defined string type.
   Include constructors that will enable us to create an uninitialized string, string s1,(stri
   with length zero) and also initialize an object with a string constant at the time of creati
   like string s2(" Well come "). Include a function that adds two strings to make a third stri
   .Write a complete programme to test your class to see that it does the following tasks:
   (i)   Creates uninitialized string objects.
   (ii)   Creates objects with string constants.
   (iii)   Concatenate two strings properly.
   (iv)   Display a desired string object.

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