WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 1st Semester Examination, 2019

CMSACOR01P- COMPUTER SCIENCE (PRACTICAL)

DAY-1

Time Allotted: 1 Hour 30 Minutes | Full Marks: 8

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

Answer any *one* question from the following

1. Design a base class containing the members Name, Roll Number, Phone Number and Address. Using this class derive a class that contains first semester marks, second semester marks. Write a program that will calculate total marks of a student obtained in the two semesters. $1 \times 8 = 8$

2. Create a class Date with data members as day, month and year. Initialized them using constructor. Overload ++ operator to increment the date by one day (Condition of end of month, end of year and leap year should be preserved).

Create a class Complex which stores a complex number (a pair of real numbers) as data members and use suitable constructor, destructor and member functions and overload operators: + (using operator/friend), – (using operator/friend).

4. Create a class Person having data members as name, gender, age and member functions as read and display. Inherit two classes named Student and Exam from person and implement them with entity like roll no, branch marks etc. Display each student's details.

5. Create a class Student with the member functions that accept name, roll number and branch as input and display it. Create two more inherited classes' Internal Exam and External Exam that accepts marks and display it.

6. Create a class Vehicle with the member functions that accept name and wheels count as input arguments and display it. Create other class light motor that inherit vehicle the member functions that accept speed limit, capacity as input. Create two more classes gear and non gear that inherit light motor with gear count as input and display it.

7. Create a class Distance to store the distance in feet and inches. Overload + and – operator to add and subtract two distances and use appropriate constructors and destructor.

8. Write a program in C++ to read an integer from Keyboard and print it digit by digit in English words using inline member function. For example consider the number 123 which should be printed one two three.

9. Design a class fraction which contains data members numerator and denominator. Include default constructor with default arguments taken as numerator = 0 and denominator = 1. Overload the operators + (addition), * (multiplication).

10. Create a class point which consists of 3 pairs of X and Y coordinates and using this design a class Line. Use suitable constructors and destructors. Check whether three line segment are the arms of a triangle.

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DAY-2

Time Allotted: 1 Hour 30 Minutes

Full Marks: 8

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

Answer any *one* question from the following $8 \times 1 = 8$

1. Write a program to remove the duplicates from the array. Then find the minimum and maximum element of the array.

2. Create a class consisting of 3 pairs of (x, y) coordinates and using this design a class Triangle. Use appropriate constructors and destructor. Write a function to check whether a triangle is equilateral / isosceles / scalene.

3. Create a class Complex which stores a complex number (a pair of real numbers) as data members and use suitable constructor, destructor and member functions and overload operators: + (using operator / friend), – (using operator / friend).

4. Create a class Box containing length, breath and height. Include following methods in it:

   (a) Calculate surface Area

   (b) Increment, Overload ++ operator

   (c) Decrement, Overload – – operator.

5. Design a class Time having hour, minute and second as data members. Use suitable constructor to initiate the object. Overload + and – operators to add and subtract two objects of the class.

6. Write a program in C++ to read a set of lines and find out the number of vowels, consonants present in the line using static member function.

Turn Over

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CMSACOR01P-COMPUTER SCIENCE (PRACTICAL)

DAY-3

Time Allotted: 1 Hour 30 Minutes

Full Marks: 8

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

Answer any *one* question from the following $8 \times 1 = 8$

1. Create a class Box containing length, breadth and height. Include following methods in it:
   (a) Calculate Volume
   (b) Overload operator == (to check equality of two boxes), as a friend function
   (c) Overload Assignment operator

2. Write a C++ program to create the Person class. Create some objects of this class (by taking information from the user). Inherit the class Person to create two classes Teacher and Student class. Maintain the respective information in the classes and create, display and delete objects of these two classes.

Create a class consisting of x and y coordinates and using this design a class Line Segment. Use appropriate constructors and destructor. Write a function to check whether two lines are perpendicular or parallel.

4. Write a C++ program to create a class Triangle. Include overloaded functions for calculating area and also overload assignment operator and equality operator.

5. Create a class Student with the member functions that accept name, roll number and branch as input and display it. Create two more inherited classes' Internal Exam and External Exam that accepts marks and display it.

6. Create a class Complex which stores a complex number (a pair of real numbers) as data members and use suitable constructor, destructor and member functions and overload operators: + (using operator/friend), – (using operator/friend).

7. Create a class Number with proper data and function members. Then inherit Number class by two other classes, To-Binary and To-Octal and override the Virtual function "display()" which is located in class Number. After overriding and defining the "display()" function inside To-Binary and To-Octal class, the function will display the decimal integer value in binary and octal by operator overloading.

8. Create a class Date with data members as day month and year. Initialized them using constructor. Overload ++ operator to increment the date by one day (Condition of end of month, end of year and leap year should be preserved).

9. Write a program in C++ to overload the + operator for concatenating two strings.

10. Design a base class containing the member student name, Roll, Address. Using this class derive a class that contains First Semester marks, Second Semester marks. Write a program in C++ that will calculate total marks of a student obtained in the two semesters.

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7. Design a class Time containing three members {hours, minutes and seconds} and the following member functions:
   (a) To read time
   (b) To display time
   (c) To get the sum of two times passed as argument

8. Create a class named Shape. Make circle, square and rectangle as object of the class Shape and calculate their surface area by concept of constructor overloading.

9. Create a class Car with one variable and one method. Create other class Auto with one variable and one method. Create another class Vehicle which can use the members of both classes.

10. Create a class Matrix that can add and subtract two matrices by overloading operator '+' and '–' respectively. There must be provision to handle the situation if the matrix size is out of range.

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