

OBJECT ORIENTED PROGRAMMING

LAB ASSIGNMENT -1

(Topics – Basics of C++, Control Structures)

Programming Questions

1. Write a program (WAP) to display "Hello World" on console display. WAP to implement the following control characters:
‘\n’ is for new line, or you can use *endl* – `cout<<endl<<"message";`
‘\t’ is for tab ; ‘\a’ is an alarm sound; ‘\r’ is carriage return to go to the beginning of the current line
2. Write a C++ program that will ask for a temperature in Celsius and display it in degree Fahrenheit. $[F=9C/5+32]$
3. WAP to calculate gross salary of a person, where **gross_salary = basic+da+ta+HRA** and da is 46% of basic and ta is 8% of basic and HRA is 9% of basic pay.
4. A certain grade of steel is graded according to the following conditions:
(i) Hardness must be greater than 50
(ii) Carbon content must be less than 0.7
(iii) Tensile strength must be greater than 5600
The grades are as follows:
Grade is 10 if all three conditions are met
Grade is 9 if all conditions (i) and (ii) are met
Grade is 8 if all conditions (ii) and (iii) are met
Grade is 7 if all conditions (i) and (iii) are met
Grade is 6 if only one condition is met
Grade is 5 if none of the conditions are met

Write a program, which will require the user to give values of hardness, carbon content and tensile strength of the steel under consideration and output the grade of the steel. (Solve using nested if-else, ladder if and else if)

5. A library charges a fine for every book return late. For first 5 days the fine is 50 paisa, for 6-10 days fine is one rupee and above 10 days fine is 5 rupees. If you return the book after 30 days your membership will be cancelled. WAP to accept no. of days the member is late to return the book and display the fine or appropriate message.

6. WAP to demonstrate for, while, do-while (with all possible variations), like for loop can be demonstrated without giving initialization in for construct or without giving increment in for construct.

Sample:

```
for (int i=0; i<10; i++)
```

```
i=0
```

```
for (; i<10; i++)
```

```
i=0
```

```
for (; i<10;)
```

```
i++
```

7. Implement *namespace* in a program to illustrate the use of same name variables and functions in different sections/libraries of the code.
8. Create a structure in C++ containing the details of Students as details below and a main function to execute the structure.

Data Members(properties):

Name

Roll No

Degree

Hostel

CurrentCGPA

Member Function(behavior):

addDetails();

updateDetails();

updateCGPA();

updateResidenceInfo();

displaydetails();

9. Differentiate between private and public access/scope. Perform the question no. 5 with structure having the data member in private scope. Students should be able to
- differentiate between structure in C vs structure in C++
10. Create a code snippet that illustrates the following:
- Calling of private member functions inside public member function
 - Access private member functions inside public member function

11. An election is contested by five candidates. The candidates are numbered 1 to 5 and the voting is done by marking the candidate number on the ballot paper. Write a program to read the ballots and count the votes cast for each candidate using an array variable count. In case, a number read is outside the range 1 to 5, the ballot should be considered as a 'spoilt ballot', and the program should also count the number of spoilt ballots.

12. Write programs to evaluate the following functions to 0.0001% accuracy.

(a) $\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$

(b) $SUM = 1 + (1/2)^2 + (1/3)^3 + (1/4)^4 + \dots$

(c) $\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \dots$

13. An electricity board charges the following rates to domestic users to discourage large consumption of energy:

For the first 100 units	60P per unit
For next 200 units	80P per unit
Beyond 300 units	90P per unit

All users are charged a minimum of Rs. 50.00. If the total amount is more than Rs. 300.00 then an additional surcharge of 15% is added. Write a program to read the names of users and number of units consumed and print out the charges with names.