



VIT

Vellore Institute of Technology

Reg. No:

Final Assessment Test - May 2024

Course: BCSE102L - Structured and Object-Oriented Programming

Class NBR(s): 3263/3275/3278

Slot: A2

Max. Marks: 100

Time: Three Hours

KEEPING MOBILE PHONE/ELECTRONIC DEVICES EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
DON'T WRITE ANYTHING ON THE QUESTION PAPER

Answer any TEN Questions

(10 X 10 = 100 Marks)

- Write a C program for the meteorological centre that reads the noon day temperature (in degrees Celsius) for each day of a week and then reports the weeks average temperature as well as the hottest and coolest days.
- Explain all storage classes using appropriate example.
- Write a C program to
 - Read radius of a circle (in main function) [3]
 - Create a function calculate() which will calculate area and perimeter of circle [3]
 - Display area and perimeter (in main function) [4]
- What is a pointer? Explain how the pointer variable declared and initialized? Discuss pointer arithmetic.
- Create a structure called employee that holds information like employee ID and name. Create another structure called address which holds information like Door_Number, Street_Name, City and Postcode. Declare the address structure inside the Employee structure. Develop a C program to input basic salary of 50 employees and calculate their gross salary according to the given conditions. Print the complete employees information and Gross salary [addition of DA, HRA and basic salary] up to two decimal places.
DA and HRA calculation is given below:
 $da = \text{basic_salary} * (DA/100)$
 $hra = \text{basic_salary} * (HRA/100)$
 Given the following HRA and DA percentages:
 Basic Salary \leq 10000 : HRA = 20%, DA = 80%
 Basic Salary between 10001 to 20000 : HRA = 25%, DA = 90%
 Basic Salary \geq 20001 : HRA = 30%, DA = 95%
- A car rental shop has two plans. In the first plan, you can rent a car for Rs.4000 per day with unlimited kilometer. In the second plan, you can rent a car for Rs.1500 per day with an extra charge of Rs.9 per kilometer. The shop maintains a database of car details such as Car Brand Name, No of days and plan type (A / B) and and customer details such as Name, Aadhaar Number. Given a set of customers, Calculate the rent for the cars based on Plan A or Plan B on a particular day and display the customer and car details along with rent for the cars by developing a C++ code(Class and Object). Also calculate and display the total rent for that day.

Output:

S.No Name Aadhar No Car Name No of Days Plan Rent

....



[5]
[5]

- 7. a) Explain copy constructor with example
- b) Distinguish between the following two statements:

```
String name ("kumar");  
String name="kumar";
```

where String is a class and name is an object of the class.

- 8. Create a base class called **shape**. Use this class to store two **double** type values that could be used to compute the area of figures. Derive two specific classes called **triangle** and **rectangle** from the base **shape**. Add to the base class, a member function **get_data()** to initialize base class data members and another member function **display_area()** to compute and display the area of figures. Make **display_area()** as a virtual function and redefine this function in the derived classes to suit their requirements.

Using these three classes, design a program that will accept dimensions of a triangle or a rectangle interactively, and display the area.

Remember the two values given as input will be treated as lengths of two sides in the case of rectangles, and as base and height in the case of triangles, and used as follows:

Area of rectangle = $x * y$
Area of triangle = $\frac{1}{2} * x * y$

- 9. Define a class string. Use overload <= operator to compare two strings using friend function.
- 10. Write a C++ program using function template to find the product of two integers or floating point type of data.
- 11. Explain virtual function with sample code.
- 12. Four experiments are performed, each experiment consisting of six test results. The result for each experiment follows. Develop a C++ code to compute and display the average of the test results for each experiment.

1st Experiment results	23.2	31.5	16.9	28.0	26.3	28.2
2nd Experiment results	34.8	45.2	20.8	39.4	33.4	36.8
3rd Experiment results	19.4	50.6	45.1	20.8	50.6	13.4
4th Experiment results	36.9	42.7	20.8	10.2	16.8	42.7