



VIT

Vellore Institute of Technology

School of Computer Science and Engineering

Winter Semester 2022-2023

Continuous Assessment Test – 1

SLOT D1

Programme Name & Branch: B.Tech (CSE)

Course Name & code: Structured and Object-Oriented Programming BCSE102L

Class Number (s): VL2022230505539

Faculty Name (s): Jayachandran. J

Exam Duration: 90 Min. 50

Maximum Marks.

| Q.No. | Question  | Max Marks |
|-------|---|-----------|
| 1.    | <p>a) Compare the entry-controlled and exit-controlled loops with a neat example. (5)</p> <p>b) Write a C program that prompts the user to input number of calls and calculate the monthly telephone bills as per the following rule:<br/>           Minimum Rs. 100 for up to 50 calls.<br/>           Plus Rs. 1.75 per call for next 50 calls.<br/>           Plus Rs. 1.50 per call for next 50 calls.<br/>           Plus Rs. 1.00 per call for any call beyond 200 calls. (5)</p> | 10        |
| 2.    | <p>a) Justify the need for type conversion in C programming. With a neat example, discuss the different ways the type conversion can be performed. (5)</p> <p>(b) Develop a C program to perform the following string manipulation operations without using in-built functions.<br/>           i) Calculate the length of String</p>  | 10        |

|       | ii) Compare two Strings. (5)  |                         |                  |                         |   |        |        |   |        |        |   |        |        |    |
|-------|---|-------------------------|------------------|-------------------------|---|--------|--------|---|--------|--------|---|--------|--------|----|
| 3.    | <p>A security firm has categorized their employees into three grades and an hourly rate is paid every day based on their grade. Details given below:</p> <table border="1"> <thead> <tr> <th>Grade</th> <th>Hourly Rate(Rs.)</th> <th>Overtime Pay (Per Hour)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>100.00</td> <td>125.00</td> </tr> <tr> <td>2</td> <td>200.00</td> <td>250.00</td> </tr> <tr> <td>3</td> <td>300.00</td> <td>375.00</td> </tr> </tbody> </table> <p>The firm has a policy for paying employees based on the number of hours they work in a day. The policy is as follows:<br/>           Less than 3 hours of work: no pay.<br/>           Between 3 and 6 hours of work: half pay (50% of the hourly rate).<br/>           More than 6 hours of work: full pay (100% of the hourly rate).<br/>           However, beyond 8 hours, the overtime pay is applicable for every additional hour.</p> <p>Implement a function 'salary()' to compute and return the salary of an employee based on the policy. The number of hours worked in a day and the grade of the employee should be passed as an arguments to the 'salary()'.</p> <p>Note: The maximum number of hours an employee can work in a day is 12 hours.</p> | Grade                   | Hourly Rate(Rs.) | Overtime Pay (Per Hour) | 1 | 100.00 | 125.00 | 2 | 200.00 | 250.00 | 3 | 300.00 | 375.00 | 10 |
| Grade | Hourly Rate(Rs.)  | Overtime Pay (Per Hour) |                  |                         |   |        |        |   |        |        |   |        |        |    |
| 1     | 100.00  | 125.00                  |                  |                         |   |        |        |   |        |        |   |        |        |    |
| 2     | 200.00  | 250.00                  |                  |                         |   |        |        |   |        |        |   |        |        |    |
| 3     | 300.00  | 375.00                  |                  |                         |   |        |        |   |        |        |   |        |        |    |
| 4.    | Data structures will grow and shrink during the program execution. How the memory allocation and reallocation can be managed at runtime? Discuss with an example program.   | 10                      |                  |                         |   |        |        |   |        |        |   |        |        |    |
|       | <p>a) Illustrate the significance of pointers when you return multiple values from a function. Discuss with a suitable code. (7)</p> <p>b) Develop a C function to swap two numbers without using a temporary variable. The swapping operation should be performed in a user-defined function (through call-by-reference) using bitwise operators. (3) (2)</p>  | 10                      |                  |                         |   |        |        |   |        |        |   |        |        |    |