


VIT

Vellore Institute of Technology
(Established by the University under section 3 of the UGC Act, 1956)
Final Assessment Test – November 2025

Course: **CSE2010** - Advanced C Programming

Class NBR(s): **1615/1622/1625/1629**

Slot: **C1**

Time: **Three Hours**

Max. Marks: **100**

- **KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE**
- **DON'T WRITE ANYTHING ON THE QUESTION PAPER**

COs	CO Statements
CO1	Learn various control structures and derived data types for solving real world problems using user defined functions.
CO2	Explore dynamic memory allocations strategies and user defined data types.
CO3	Realize the features of various Input and Output methods including files.
CO4	Idealize the power of preprocessor directives and recognize programming methods.
CO5	Able to modularize the programming using various input, output, mathematical and utility functions in C and unix system interfaces.
CO6	Able to design the software in c using features of graphics, embedded programming concepts.
CO7	Apply the learned concepts and design algorithmic solutions for the real world problems.

BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)

Answer ALL Questions
(10 X 10 = 100 Marks)

- A positive integer $n > 1$ is called a Mersenne prime if it is prime and can be written as $n = 2^k - 1$ for some positive integer k . For example, 3, 7 and 31 are all Mersenne primes because 3, 7 and 31 are all prime numbers and $3 = 2^2 - 1$, $7 = 2^3 - 1$ and $31 = 2^5 - 1$. Write a C program to take a positive integer as input, find and print all Mersenne prime numbers up to the given range.

CO1 BL3
- Write a C program that compares 2 matrices element by element and print results as follows: if both the elements are same store 0 in resultant matrix. If the element in the first matrix is greater than the element in the second matrix, store 1 in resultant matrix. Other-wise store the -1 in resultant matrix.

CO1 BL3
- Explain the standard library functions for dynamic memory allocation with example programs.

CO2 BL2
- A company has an employee management system where each employee has an ID, name, age, salary, and department. The system should allow adding new employees, calculating the average salary, and finding the highest-paid employee. Use structures to store employee details, an array of structures to store multiple employees, and pointers to pass and return employee information between functions.

CO2 BL3

5. Explain the typedef and bit-fields in C language and illustrate with own examples.

CO2 BL2

6.a) A bank maintains a customer's balance in a file named bank.txt (initial balance = 5000). Write a C program to simulate bank transactions using file handling. The program should provide a menu with the following options: 1-Display balance, 2-Deposit amount and 3-Withdraw amount. After performing the selected operation, the updated balance should be stored back in the file and displayed to the user.

CO3 BL3

OR

6.b) A cricket board wants to automatically generate a scoreboard based on the live running commentary stored in a text file. The commentary contains entries such as "One run", "Two run", "Three run", "Four run", "Five run", and "Six run" for each ball played. The task is to read the text file, process the data, and calculate the total score of the team. The program should handle the input efficiently and generate the final scoreboard displaying the runs scored.

CO3 BL3

7.a) Develop an event registration program using a user-defined header file. Implement all functions inside the header file, including inputting participant details, displaying participants, and counting total registrations. Include this header in main.c to manage multiple participants and display the registration list along with the total number of participants.

CO4 BL3

OR

7.b) A software company is developing a file copy tool. The program should accept two command line arguments: the source file name and the destination file name. It should copy all contents from the source to the destination. Write a C program to demonstrate command line arguments for this scenario.

CO4 BL3

8. An e-commerce website requires OTP verification during login. Write a C program using utility and time functions that generates a random 6-digit OTP and asks the user to enter it within 15 seconds. If the user enters the OTP correctly and within time then display "Login Successful"; else, display "Session Expired".

CO5 BL3

9. Analyze the differences between C and Embedded C in terms of their suitability for real-time applications. Justify your answer with examples.

CO6 BL4

10. Give five examples of real-world problems where arrays provide solutions with explanations.

CO7 BL3

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