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Question Paper Code : 11160

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2026.

Second Semester

Computer Science and Engineering

CS3251 — PROGRAMMING IN C

(Common to : Computer Science and Engineering (Artificial Intelligence and Machine Learning)/Computer Science and Engineering (Cyber Security)/Computer and Communication Engineering/Information Technology)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List any four applications of the C programming language.
2. Define a keyword and give two examples.
3. What is a two-dimensional array? Give its general declaration.
4. Write the syntax of any two string handling functions in C.
5. Define recursion with an example.
6. What is a pointer? Mention any two pointer arithmetic operations.
7. Define a structure with an example declaration.
8. Differentiate between structure and union.
9. What is a file pointer in C?
10. Differentiate between sequential and random access files.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain in detail the structure of a C program with an example. (6)
(ii) Write a C program to find the sum and average of N numbers using a looping construct and explain the logic with sample input and output. (10)

Or

- (b) (i) Explain the different types of operators available in C with examples. (6)
(ii) Write a C program to display the sum of even numbers and odd numbers separately for the first N integers using for loop. (10)
12. (a) (i) Explain the declaration, initialization, and memory representation of one-dimensional and two-dimensional arrays in C. (8)
(ii) Write a C program to perform the following operations on strings without using built-in functions: (8)
(1) Concatenate two strings
(2) Compare two strings
(3) Find the length of a string

Or

- (b) (i) Describe the procedure to search an element in an array using binary search. Write its algorithm and explain with an example array. (8)
(ii) Write a C program to sort a list of N student marks in descending order using the Selection Sort algorithm and display the top three marks. (8)
13. (a) (i) Explain the different types of functions in C. Illustrate with suitable examples for call by value and call by reference. (8)
(ii) Write a C program using recursion to find the greatest common divisor (GCD) of two numbers. Also, trace the recursive calls. (8)

Or

- (b) (i) Explain the role of pointers in C. Discuss pointer arithmetic operations with simple examples. (8)
(ii) Write a C program using functions and pointers to swap the values of two variables without using a third variable. (8)

14. (a) (i) Explain the concept of nested structures and arrays of structures with a C example. (6)
- (ii) Design a C program to create a structure named Student with fields: RollNo, Name, and Marks in three subjects. Calculate the total and average marks for 5 students and display them in a formatted table. (10)

Or

- (b) (i) Discuss the concept of self-referential structures and explain how they are useful in implementing linked lists. (8)
- (ii) Write a C program using structures to maintain employee details (Employee_ID, Name, Department, Salary). (8)
- Perform the following operations:
- (1) Display all employee details
- (2) Find and print the employee with the highest salary.

15. (a) (i) Explain the different file opening modes in C with syntax and examples. (6)
- (ii) Write a C program to read the content of a text file and count the number of lines, words, and characters present in it. (10)

Or

- (b) (i) Explain the concept of file handling in C. Discuss different file modes and functions used for file operations. (8)
- (ii) Write a C program to copy the contents of one text file into another file using file I/O functions. (8)

