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Question Paper Code : 11167

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

Third Semester

Electrical and Electronics Engineering

CS3353 — C PROGRAMMING AND DATA STRUCTURES

(Common to: Electronics and Communication Engineering/Electronics and Instrumentation Engineering/Electronics and Telecommunication Engineering/Instrumentation and Control Engineering)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What do you mean by C token?
2. Differentiate between exit controlled and entry controlled loops.
3. What is an enumerated data type in C? Give an example.
4. What is constant pointer? Why array is called constant pointer?
5. What is ADT? Give an example.
6. Write a function to insert a node at the beginning of a singly linked list.
7. Write a C function to perform in-order traversal of a binary tree.
8. What is a hash collision? Give an example.
9. What is the time complexity of quick sort?
10. Write down the difference between linear search and binary search.

PART B — (5 × 13 = 65 marks)

11. (a) (i) Explain data types, operators, and conditional statements in C with syntax and suitable examples. (7)
- (ii) Write a C program to find the GCD of two numbers using recursion. (6)

Or

- (b) (i) Write short notes on arrays and explain how 1D and 2D arrays are declared and initialized with examples. (7)
- (ii) Write a C program to perform matrix multiplication (6)

12. (a) Explain the concept of pointers with examples. Discuss pointer arithmetic and pointer to pointer operations.

Or

- (b) Write in detail about structures and unions. Explain how arrays of structures are declared and accessed in C.
13. (a) Explain the implementation of stacks using arrays and linked lists. Illustrate with push and pop operations.

Or

- (b) Discuss queue operations (enqueue, dequeue) and differentiate between linear queue and circular queue.
14. (a) Explain the binary search tree (BST) and its operations with examples.

Or

- (b) Describe hashing techniques: open addressing, linear probing, and double hashing with suitable examples.
15. (a) Compare and explain insertion sort, selection sort, and bubble sort with time complexities.

Or

- (b) Explain the logic of merge sort with an example. Also write a C program to implement merge sort on an array of integers.

PART C — (1 × 15 = 15 marks)

16. (a) Design a student record management system in C using structures. The structure should store student rollno, name, dob, and CGPA.

Write menu driven functionalities using array of objects to perform record creation, search and display list of students with $CGPA \geq 8$.

Or

- (b) Create a doubly linked list and write algorithms for following task.
- (i) Insert node at the end (4)
 - (ii) Search a node (4)
 - (iii) Delete first node (4)
 - (iv) Insert a node after a specified element. (3)