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Reg. No. :

**Question Paper Code : 25077**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Third Semester

Electronics and Communication Engineering

EC 8393 – FUNDAMENTALS OF DATA STRUCTURES IN C

(Common to: Electronics and Telecommunication Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the primary data types in C.
2. What are the string operations defined in C?
3. Define - Preprocessor directives and list out a few examples.
4. Differentiate between structures and unions.
5. What are the pros and cons of arrays and linked list?
6. What are the operations of a stack?
7. Define Binary search tree.
8. What is the advantage of having hashing compared to other traditional data structures?
9. Differentiate — Internal with external sorting.
10. How to take care of an overflow problem in hashing?

PART B — (5 × 13 = 65 marks)

11. (a) (i) Write a C program to get two strings and display the result of at least 5 possible string operations. (7)
- (ii) Write a C program to get a 4 digit number and display the reverse of the same number. (6)

Or

- (b) Write a C program to find the following, where A, B and C are the matrices whose orders are  $M \times N$ ,  $M \times N$  and  $N \times N$  respectively.  $A = A + B * C$ .

12. (a) (i) Differentiate the data types, structures with unions. (7)
- (ii) Write a C program to get 10 student details using structures from the user and display these details on the screen. (6)

Or

- (b) (i) Write a C program to get two numbers and exchange these numbers using pass by value and pass reference. (7)
- (ii) Write a C program to find the factorial of a given number using recursive functions. (6)

13. (a) (i) Write a C program to perform all the operations of the Stack. (7)
- (ii) Explain the evaluation of the expression using the stack in Infix notation.

Or

- (b) Write a procedure to perform polynomial addition using linked lists.

14. (a) Write a C program to insert set of numbers in a binary search tree and display the content of the same with in-order traversal.

Or

- (b) Explain - Set representations and Union-Find operations with suitable examples.

15. (a) Write a C program to sort the following set of numbers using a quick sorting algorithm. Find the time complexity of the same. Give the trace of the algorithm for the following given set of numbers. 10, 100, 50, 75, 25, 150, 125, 115, 175, 110. (13)

Or

- (b) Write a procedure to search for a number among the given set of numbers using Linear and binary search algorithms and compare and contrast both with an example including time complexity. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Sort the following numbers using Merger sort algorithm. 11, 8, 55, 22, 33, 27, 62, 35, 71. Obtain the worst case and average case time complexity. (16)

Or

- (b) Explain the Breadth First Search (BFS) with a suitable example. (16)