Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 90179

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

Third/Fourth Semester

Electronics and Communication Engineering

EC 8393 – FUNDAMENTALS OF DATA STRUCTURES IN C

(Common to Medical Electronics/Biomedical Engineering/Electronics and Telecommunication Engineering)

(Regulations 2017)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions

PART – A   (10×2=20 Marks)

1. Write a C program to get a paragraph of text as input.

2. Give the length and range of the primitive data types.

3. What does #include<header_name> do ? How is it possible to tell the preprocessor where to look for header files ?

4. Differentiate pass by value and pass by reference in function call.

5. Differentiate row major and column major representations of arrays.

6. Given an array how is it possible to efficiently store 2 stacks in the same array.

7. Write simple implementations of the union and find operations in disjoint sets.

8. How will you perform preorder and inorder traversal on the following tree ?
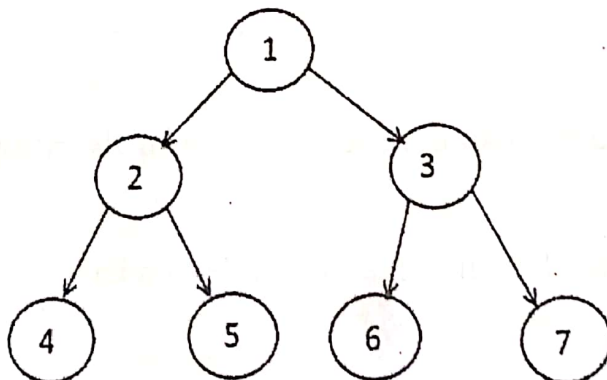
9. Show the arrangement of the elements 5, 1, 8, 3, 9, 2 at the end of the second pass when sorting using bubble sort.

10. Show how many comparisons are required to search for the element '10' in the list : 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 using linear search and binary search. What are the elements compared with in both the cases ?

(5×13=65 Marks)

PART – B

11. a) Describe the various operators in C with examples and the associativity.

(OR)

b) Describe the decision making, branching and looping statements in C.

12. a) Explain recursion and write a C program to print the first 'n' numbers in the Fibonacci series using recursion.

(OR)

b) Explain structures and write a C program using structures to store the roll_ num, name, marks in 10 subjects of 100 students. Calculate the grade of each student and print the student information. The grades are calculated as follows :

Letter Grade	Grade Points	Marks Range
O (Outstanding)	10	91 – 100
A+ (Excellent)	9	81 – 90
A (Very Good)	8	71 – 80
B+ (Good)	7	61 – 70
B (Average)	6	50 – 60
RA	0	<50

13. a) Explain with suitable diagrams how to represent and add two polynomials using linked lists.

(OR)

b) Explain how expressions can be evaluated using stacks and write an algorithm for the same.

14. a) Write algorithms to insert and delete elements in a binary search tree represented using arrays.

(OR)

b) Write algorithms to perform depth first and breadth first traversal on graphs.

15. a) Write an algorithm to sort 'n' numbers using merge sort. Trace the algorithm for the numbers 38, 27, 43, 3, 9, 82, 10 and show the order in which they are processed.

(OR)

 b) Write an algorithm to sort 'n' numbers using quick sort. Trace the algorithm for the numbers 44, 33, 11, 55, 77, 90, 40, 60, 99, 22, 88, 66 and show the order in which they are processed.

PART – C
(1×15=15 Marks)

16. a) Given an array of integers write a C program to find the closest value to the given number. Array may contain duplicate values and negative numbers.

Example : Array : 5, 2, 6, 8, 7, 6, 8, 9

Target number : 5

Output : 5

Target number : 11

Output : 9

Target Number : 4

Output : 5

(OR)

 b) Given a singly linked list, write an algorithm to remove the duplicates in the linked list.

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