

**Code: 13A12101**
**R13**

B.Tech I Year (R13) Regular Examinations June/July 2014

**PROGRAMMING IN C & DATA STRUCTURES**

(Common to CE, ME, EEE, ECE, EIE, IT, AE, MCTE &amp; Ch.E)

Time: 3 hours

Max. Marks: 70

**Part – A**  
**(Compulsory Question)**  
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1 Answer the following: (10 X 02 = 20 Marks)

- What is system software? Give examples.
- Define algorithm and given an example.
- What is the output of the following program

```
#include <stdio.h>
void main()
{
    int a = 20;
    char ch = '9';
    char st = 'ab';
    float f = 20.23;
    printf("\na = %d", &a);
    printf("\nch=%d\tch=%d", ch, &ch);
    printf("st = %c", st);
    printf("f = %d", f);
}
```

- Briefly describe the iterative statements.
- How do you declare and initialize a multidimensional array? Give an example.
- Mention the purpose of the functions `strset()` and `strcpy()`.
- What is a file? What is the use of 'r' and 'w' in file-type specification?
- Which is the best method among parameter passing methods? Why?
- List the major advantages of data structures.
- What is the in-order and post-order traversals of the following tree:


**Part – B**  
**(Answer all five units, 05 X 10 = 50 Marks)**
**UNIT- I**

- What are the different types of programming languages? Explain their features.
  - Define hardware. Explain the purpose of various hardware parts of a computer.

OR

- List and define the questions that are raised while sorting the data structures.
  - Write the algorithm to check whether a given number is prime or not.

**UNIT - II**

- What is an error? Give a brief note on the run time errors.
  - Write a C program to find the factorial of a number using recursive functions.

OR

- Explain various branching statements in C with examples

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**Code: 13A12101****R13****UNIT - III**

- 6 (a) How to pass array elements as arguments to function? Explain with one example.  
(b) Write a C program to read names, marks of a class and calculate the total marks, average and percentage.

**OR**

- 7 What is meant by sorting? Write the algorithm for selection sort and illustrate with an example.

**UNIT - IV**

- 8 (a) Define pointer. How to pass a pointer to a function? Explain.  
(b) List the advantages of dynamic memory allocation over static memory allocation. Explain the functions, used for dynamic allocation of memory with their syntax.

**OR**

- 9 (a) How do you define structure within a structure? Explain with an example.  
(b) Give the differences between structure and union.  
(c) Briefly explain bit fields concept.

**UNIT - V**

- 10 (a) Explain the operations performed on a circular queue.  
(b) With an example explain how an infix expression is converted to a postfix expression.

**OR**

- 11 (a) What is a singly linked list? How do represent the linked list?  
(b) Discuss operations performed on a linked list with suitable examples.

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