**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 & Ch.E)

Time: 3 hours                                                                                    Max. Marks: 70

Part – A
(Compulsory Question)
*****

1    Answer the following: (10 X 02 = 20 Marks)

(a)    What is system software? Give examples.

(b)    Define algorithm and given an example.

(c)    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);
 }
```

(d)    Briefly describe the iterative statements.

(e)    How do you declare and initialize a multidimensional array? Give an example.

(f)    Mention the purpose of the functions strset() and strcpy().

(g)    What is a file? What is the use of 'r' and 'w' in file-type specification?

(h)    Which is the best method among parameter passing methods? Why?

(i)    List the major advantages of data structures.

(j)    What is the in-order and post-order traversals of the following tree:
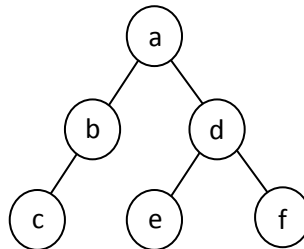


Part – B
(Answer all five units, 05 X 10 = 50 Marks)

UNIT- I

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

OR

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

UNIT - II

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

OR

5    Explain various branching statements in C with examples

## 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.

******