Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Sc.(H)(GENET,BT,MOL.BIO.,MICRO.BIO./SEM-2/CA-201/2011

2011

INTRODUCTION TO C-PROGRAMMING & DIGITAL LOGIC

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

   i) Hexadecimal number E is equal to binary number

   a) 1110 b) 1101

   c) 1001 d) 1111.

   ii) Which one of the following will read a character from the keyboard and will store it in the variable *c* ?

   a) *c* = getc(); b) getc(&*c*);

   c) getchar(&c); d) *c* = getchar();

iii) Which one of the following C operators is right associative ?

a) = b) '

c) [] d) □

iv) Which is non-volatile memory ?

a) RAM b) ROM

c) both (a) and (b) d) none of these.

v) Total no. of elements in a[5][8] array is

a) 39 b) 13

c) 40 d) 16.

vi) What will be output if you will execute following *c* code ?

```
#include<stdio.h>
int main(){
int a, b;
    a = – 3 – – 3;
    b = – 3 – – ( – 3 );
    printf("%d %d", a, b);
    return 0 ;
}
```

a) 0 0 b) 0 – 3

c) – 3 0 d) compilation error.

vii) IC s are

a) analog

b) digital

c) both analog and digital

d) mostly analog.

viii) Give the output :

```
#include<stdio.h>
int main(){
    for(;NULL;)
        printf("cquestionbank");
    return 0;
```

a) c

b) bank

c) compilation error

d) cquestionbank.

ix) What will be the output ?

```
Void main()
{
    int x = 2 * 3 + 4 * 5;
    printf("%d",x);
    }
```

a) 50 b) 45

c) 26 d) 23.

x) Which one the following provides conceptual support for function calls ?

a) The system stack b) The data segment

c) The text segment d) The heap.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. What do you mean by automatic storage class ? Distinguish between Logical Operator and Relational Operator. 3 + 2

3. Differentiate between Actual argument and Formal argument with example.

4. What is Structure ? Discuss disadvantages of switch statement over if-else statement. 2 + 3

5. Prove De Morgan's Theorem (a + b)' = a' * b' using truth table.

6. a) Perform the subtraction using 2's complement and 1's complement :

11010-1101

b) Explain the principle of OR gate with diagram. $2\frac{1}{2} + 2\frac{1}{2}$

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) What is Function ?

b) What do you mean by Recursion ?

c) Explain Calling Function and Called Function with suitable example.

d) Write down a recursive function in *C* which accept a non-negative integer and returns its factorial value.

1 + 2 + 4 + 8

8. a) What is Pointer ?

b) Differentiate between pointer variable and real variable.

c) What do you mean by pointer to a character ?

d) Differentiate between pointer to an integer and pointer to an integer pointer.

e) How will you pass the base address of an array to a function ?

f) Distinguish between 'address of' operator and 'value at address' operator. 1 + 2 + 2 + 4 + 3 + 3

9. a) What do you mean by sequential circuit ?

b) What are the synchronous and a synchronous sequential circuit ?

c) What is flip-flop ?

d)

Input			***Output***	
X	Y	Z	F1	F2
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

i) Obtain the simplified function in sum of product

ii) Obtain the simplified function in product of sum.

2 + 3 + 2 + 8

10. a) Define universal gate.

    b) Proof : NAND gate is a universal gate.

    c) Simplify the following function and draw the logic circuit :

    $X = PQR + PQ' R = PQR' + PQ' R'$. 2 + 8 + 5

11. a) Give the truth table of full adder and draw the circuit diagram.

    b) Simplify the following function using Karnaugh Map and draw the circuit :

    F (A, B, C, D) = (0, 1, 4, 10, 11, 14, 15). 7 + 8