

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 × 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) ' ' (single quote)
- c) []
- d) [] (square brackets)

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 ?

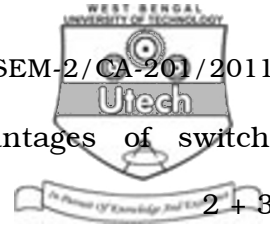
- a) The system stack
- b) The data segment
- c) The text segment
- d) The heap.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

- 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 :

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

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 :

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