Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Sc.(H)/(BT/GEN/MICRO-BIO/MOL-BIO)/SEM-2/CA-201/2013

2013

INTRODUCTION TO C PROGRAMMING AND 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 any *ten* of the following : $10 \times 1 = 10$

i) Hexadecimal number *C* is equal to

a) 1110 b) 1100

c) 1001 d) 1111.

ii) In binary system A0D becomes

a) 101000001101 b) 100100001110

c) 110000001011 d) 101100001101.

iii) Statement terminator is represented as

a) : b) Blank

c) ; d) /*n*.

iv)
```
{
clrscr();
int x = 36, y = 5, w, z;
w = x/y;
z=x%y;
printf ("w=%d and z=%d", w,z);
getch();
}
```

The output will be

a) w = 7·2 and z = 0 b) w = 7 and z = 1

c) w = 0 and z = 7·2 d) w = 1 and z = 7.

v)
```
{
clrscr();
int a,b,c;
b=4;
a=2*(b++);
c=2*(++b);
printf ("a=%d, b=%d, c=%d\n", a,b,c);
getch();
}
```

The output will be

a) a=8, b=6, c=12 b) a=6, b=8, c=12

c) a=12, b=6, c=8 d) a=8, b=12, c=6.

vi) $\overline{\overline{A} + C\overline{D}}$ equals

a) $A \,.\, (\overline{C} + D)$ b) $\overline{A} \,.\, (C + D)$

c) $A \,.\, (C + D)$ d) $\overline{A} \,.\, (C + D)$

vii) The function getch () is available in

a) stdio.h b) conio.h

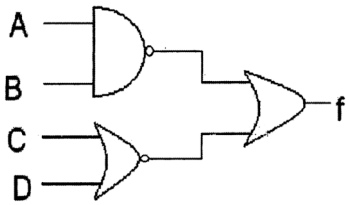
c) alloc.h d) dos.h

viii) In which two-input gate, similar inputs produce zero output and dissimilar inputs produce an output 1 ?

a) OR b) XOR

c) NAND d) XNOR.

ix)



f is equal to

a) $\overline{(A + B)} + \overline{(CD)}$ b) $\overline{AB} + \overline{C + D}$

c) $((A + B) \,.\, (CD)$ d) $\overline{(AB)} \,.\, \overline{(C + D)}$.

x) An array name is

a) a keyword

b) base address of the array

b) both (a) and (b)

d) none of these.

xi)
```
{
clrscr();
int*y,x=5;
y=&x;
}
```

Here y is

a) a data b) a pointer

c) an instruction d) none of these.

xii) $(25)_6$ is equal to

a) $(16)_{10}$ b) $(17)_{10}$

c) $(18)_{10}$ d) $(19)_{10}$.

GROUP – B

(Short Answer Type Questions)

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

2. a) State and prove De Morgan's laws.

   Prove that $(A + B)(A + C) = A + BC$

   b) Draw the circuit symbol, switch equivalent circuit and truth table for a NOR Gate. 3 + 2

3. Draw the circuit symbol, switch equivalent circuit and truth table for a NOR Gate.

4. What is an Algorithm ? Write down the Algorithm to find the maximum among a set of numbers.

5. What is a Flow Chart ? Draw the Flow Chart to find the average of a set of numbers.

6. Write a C program to find the sum of digits of a number.

GROUP – C

(Long Answer Type Questions)

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

7. a) Write a *C* program to implement sequential search. 7

b) Write a C program to check the number is palindrome or not. 8

8. a) Write a *C* program to create a calculator. 8

b) What do you mean by two-dimensional arrays ? Give a proper example of it. What do you mean by the address of an array ? 7

9. a) Write a *C* program to create a login page by using nested condition. 5

b) Give the circuit diagram of J-K flip-flop. 10

10. a) What is a flip-flop ? 2

b) What are the uses of flip-flop ? 3

c) Explain the different types of RAM and ROM. 5

d) Draw a block diagram of a digital multiplexer and explain its function. 5

11. Write short notes on any *three* of the following : 3 × 5

a) Ring counter

b) D-flip-flop

c) Pointer

d) Multiplexer

e) Functions.