Code: DC05 **Subject: PROBLEM SOLVING THROUGH**
Time: 3 Hours **Max. Marks: 1**

DECEMBER 2010

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after half an hour of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. Which one of the following statements is TRUE with respect to 'C' Language?

(A) Declarations can appear anywhere in a program.
(B) Variable name marks and Marks are same.
(C) Underscore can be used anywhere within the identifier name.
(D) Character constants are coded using double quotes.

b. & operator is a

(A) Relational operator **(B)** Logical operator
(C) Bitwise operator **(D)** Special operator

c. What will be the value of the variable c in the following code?

```
int a = 10 , b = 3;
float c;
c=a/b;
```

(A) 3.33 **(B)** 3.0
(C) 3.333333 **(D)** 3

d. The result of -14 % 3 is

(A) 2 **(B)** 4.666667
(C) -2 **(D)** 4

e. Which of the following is an Entry-Controlled loop?

(A) For Loop **(B)** While Loop
(C) Do … While Loop **(D)** Both **(A)** and **(B)**

f. The output of the following code is

```
for ( i = 1 ; i <= 10 ; i++ );
 printf("%d" , i);
```

(A) numbers from 1 to 10 are printed **(B)** 11
(C) 1 **(D)** syntax error

g. Which of the following storage class can be used to retain values between function calls.

(A) Auto **(B)** extern
(C) register **(D)** static

h. Which of the following statement is NOT TRUE with respect to functions in 'C'

(A) A function without a return statement is illegal
(B) A function can call itself.
(C) Global variables are visible in all blocks and function in the program.
(D) A function can return only one value.

i. To add data in the end to a pre-existing file, the file is opened in _____ mode.

(A) r mode **(B)** a mode
(C) w mode **(D)** u mode

j. What will be the output of the following code

```
int q , *p , n;
q = 120;
p = &q;
n = *p;
printf("%d",n);
```

(Assuming that the address of a q= 3200 and that of P is 2200.)

(A) 3200 **(B)** 120
(C) 2200 **(D)** None of the above

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. Write a program in C to compute the sum of digits of a number entered by the user. **(8)**

b. Differentiate between the following:
(i) break and continue
(ii) malloc ( ) and calloc ( )
(iii) while and do---while loop.
(iv) compiler and interpreter. **(8)**

Q.3 a. What are the various storage classes available in C. Explain them on basis of scope , lifetime and visibility.

b. Write a program in 'C' to input the rollno and marks in physics, chemistry, maths of a student. Calculate the total, percentage and division of the student based on the given criteria: **(8)**

>=60 %	First
>= 50 % and <60 %	Second
>=40% and < 50 %	Third
<40 %	Fail

Q.4 a. What is recursion? Write a program in C to print the factorial of a given number using recursion. **(8)**

b. What are pointers? List out some of the advantages of using pointers. **(8)**

Q.5 a. Define a structure to store the following information about a book in a library book no. , book name , author name , pub name , price , no. of copies. Assume appropriate field sizes. **(4)**

b. Write an algorithm to print the sum of squares of all odd numbers from 1 to 100. **(6)**

c. Briefly explain the following functions in 'C'.
(i) getch() (ii) getche() (iii) getchar() **(6)**

Q.6 a. Design an algorithm to generate the first 20 numbers in the fibonacci series. **(8)**

b. Briefly explain the various types of errors that can exist in a program with an example of each. **(8)**

Q.7 a. What is structured programming? What are its main features and list out the advantages of structured programming? **(8)**

b. Explain the different ways of initializing one-dimensional arrays with examples. **(8)**

Q.8 a. Describe the process of creating and executing a 'C' program using a flow chart **(8)**

b. Write a program in C using the loop to print the following: **(8)**

```
1
1   2
1   2   3
1   2   3   4
1   2   3   4   5
```

Q.9 a. Briefly explain the characteristics or objectives of a good program. **(8)**

b. Write an algorithm to print the given integer in reverse order. **(8)**