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MCS-011

**MASTER OF COMPUTER
APPLICATIONS (REVISED)/
BACHELOR OF COMPUTER
APPLICATIONS (REVISED)
[MCA (REVISED)/
(BCA) (REVISED)]**

Term-End Examination

June, 2026

**MCS-011 : PROBLEM SOLVING AND
PROGRAMMING**

Time : 3 Hours

Maximum Marks : 100

Weightage : 70%

Note : (i) *Question No. 1 is compulsory.*

(ii) *Answer any three questions from the
rest.*

1. (a) Write an algorithm and draw a corresponding flow chart to find the factorial of all numbers from 1 to 10. 10
- (b) Write a recursive function to calculate 'n' terms of the Fibonacci series. 10
- (c) Write a program to display string 'IGNOU' in the following pattern (using 'LOOP' control statement) : 10

I

IG

IGN

IGNO

IGNOU
- (d) Define an array. What are the types of array in C ? How are arrays declared and initialized ? Write a C code segment to explain it. 10

2. (a) Explain the usage of the conditional operators in C with an example. How does it differ from using an if-else statement ? Explain it by taking the example of a C code. Write the code by taking the same problem but writing it in two different ways as mentioned above. 6
- (b) Write a C program to manage student records using structures. Allow the user to input details such as name, roll number, marks in different subjects, and calculate the total marks and percentage. 8
- (c) List and explain relational and logical categories of operators in C along with suitable examples. 6

3. (a) Write a program in C to classify employee's performance based on the number of training sessions attended in a year into different categories such as Excellent, Good, Average, Below Average and Poor. 7

Criteria :

- Excellent : Attended 20 or more training sessions.
- Good : Attended 15-19 training sessions.
- Average : Attended 10-14 training sessions.
- Below Average : Attended 5-9 training sessions.
- Poor : Attended less than 5 training sessions.

- (b) What is a macro ? How is it defined in C ? Write a C program to calculate the area of a circle given its radius using macro. 5
- (c) What is *switch* statement in C ? Write a C program to make a simple calculator, using multiple switch statements, that performs addition, subtraction, multiplication and division on two variables given by user. 8
4. (a) Write a C program to compute the binomial coefficient given below by using the concept of function : 8

$${}^nC_r \text{ defined as } {}^nC_r = \frac{n!}{r!(n-r)!}$$

(b) Describe the process of file handling in

C. Write a program to read data from a text file and count the number of characters in the file and display the result. 7

(c) What will be the output of the following code ? Also explain the reason for that output : 5

```
# include < stdio.h>
```

```
int main ( ) {
```

```
    int a = 1, b = 1, c, d;
```

```
    c = a++ + b;
```

```
    d = ++ a + b;
```

```
    printf ( "%d, %d, %d, %d", a, b, c,  
    d);
```

```
    return 0;
```

```
}
```

5. (a) Describe the role of header files in C programming. Write a program to illustrate the usage of header files. 5
- (b) Explain the use of pointers and its characteristics with examples. 5
- (c) Write a note on *type casting*. Explain with examples. 5
- (d) Explain the difference between `getchar( )` and `gets( )` while taking string input from the user in C. 5

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