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MCS-011

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

Term-End Examination

December, 2025

**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 flowchart to find the reverse of a given number and check if it is a palindrome or not. 10
- (b) List and explain various categories of operators in a C along with an example for each. 10
- (c) Write a C program to generate the following pattern : 10
- ```
*
* *
* * *
* * * *
* * * * *
```
- (d) Write a C program to find the factorial of a given number using a recursive function. 10

2. (a) What are the differences between a while loop and a do---while loop in C ? Provide C code to illustrate your explanation for both. 6
- (b) Write a C program to search a given element in the array. If value exists, then print that value along with its position (index) in the array otherwise display “element not found”. 8
- (c) Differentiate between call by value and call by reference with an example. 6
3. (a) Write a program in C to classify students’ performance based on their marks into different categories such as Excellent, Good, Satisfactory, Pass and Fail. 7

*Criteria :*

- Excellent : Marks greater than or equal to 90
- Good : Marks between 80 and 89

- Satisfactory : Marks between 70 and 79
  - Pass : Marks between 40 and 69
  - Fail : Marks less than 40
- (b) Explain the concept of preprocessor directives in C programming. Provide examples of *three* commonly used preprocessor directives and describe their functions. 8
- (c) Describe file handling in C. Explain various access modes for opening the file. 5
4. (a) What will be the output of the following code ? Also, explain the reason for that output : 5

```
#include<stdio.h>

int main () {
 int x = 5, y = 3, z ;
 z = x -- * y;
 printf ("%d, %d", x, z);
 return 0;
}
```

- (b) Write a C program to check if a given number is Armstrong number or not.

(An Armstrong number is a special kind of number in Math. It's a number that equals the sum of its digits, each raised to a power  $n$ , where  $n$  is the number of digits in the number for example, if you have a number like 153, it's an Armstrong number because  $1^3 + 5^3 + 3^3$  equals 153). 10

- (c) Define an array. How are arrays declared and initialized ? Write a C code segment to explain it. 5

5. (a) Differentiate between *break* statement, *continue* statement and *goto* statement, with examples. 10

- (b) Explain any *five* built-in string functions in C with examples. 5
- (c) Differentiate between Structure and Union. Write a C code segment to explain the difference. 5

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