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**MCS-011**

**MASTER OF COMPUTER  
APPLICATIONS (Revised) (MCA)**

**Term-End Examination**

**June, 2024**

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

*Time : 3 Hours*

*Maximum Marks : 100*

*Weightage : 75%*

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

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

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1. (a) Write an algorithm and draw corresponding flowchart to print first  $n$  even natural numbers and find their sum. 10

**P. T. O.**

(b) Define recursion. Explain it with *one* example of C code segment. 6

(c) Write a program to generate the following pattern : 8

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1
2 3
4 5 6
7 8 9 10
```

(d) Find the square and cube of any given number using Macro. 5

(e) Define a structure. How do we declare and use the structure ? Explain with an example. 5

(f) Explain the following looping constructs in C by giving code segment of each : 6

(i) While

(ii) For

2. (a) Explain a conditional operator in C. Write a program in C to find the greater number between two numbers using conditional operator. 6
- (b) Write a C program to calculate income tax of an employee based on annual salary : 8
- If salary < 5 lakhs : No tax
- 5 lakhs – 8 lakhs : 10% tax
- 8 lakhs – 10 lakhs : 25% tax
- Salary > 10 lakhs : 30% tax
- (c) Define a function in C. List and explain various categories of functions. 6
3. (a) Simulate the calculator to perform arithmetic operations add, subtract, multiplication, division on two variables depending on the choice selected by the user. 10

- (b) Write a program to find maximum marks among the marks of 10 students using arrays. 10
4. (a) Describe the initialization, declaration of pointer, accessing a variable using pointer with the help of an example. 5
- (b) Differentiate between sequential and random file access. Also write inbuilt functions in C related to file access. 10
- (c) Write a C program to obtain GCD of two numbers. 5
5. Write short notes on the following : 5×4=20
- (i) Storage classes in C
  - (ii) Preprocessor directives
  - (iii) Precedence of operators
  - (iv) Typecasting