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**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA**  
(An Autonomous Institute Affiliated to AKTU, Lucknow)

**MCA**

**SEM: I - THEORY EXAMINATION (2025 - 2026)**

**Subject: Programming in C**

**Time: 3 Hours**

**Max. Marks: 100**

**General Instructions:**

**IMP:** Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C**. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

**SECTION-A**

20

1. Attempt all parts:-

1-a. Algorithm is mainly used for [K1] [CO1]

1

- (a) Compiling program
- (b) Storing data
- (c) Designing steps to solve problem
- (d) Linking program

1-b. Escape sequence for newline is [K1] [CO1]

1

- (a) \n
- (b) \t
- (c) \0
- (d) \b

1-c. Option that is an entry-controlled loop: [K1][CO2]

1

- (a) for loop
- (b) do-while loop
- (c) switch
- (d) goto

1-d. Output of `for(i=0;i<3;i++){printf("%d",i);}` : [K2][CO2]

1

- (a) 1 2 3
- (b) 1 2
- (c) 0 1 2
- (d) 0 1 2 3

1-e. Effect of incrementing a pointer to int (p++)? [K2][CO3]

1

- (a) Increases by 1 byte  
 (b) Increases by 2 bytes  
 (c) Increases by 4 bytes  
 (d) Increases by 8 bytes
- 1-f. For int a[5] = {1,2,3}; value of a[3] is: [K2][CO3] 1  
 (a) 0  
 (b) 3  
 (c) Garbage  
 (d) 2
- 1-g. For struct Point {int x,y;}; struct Point p={1,2}; value of p.y is: [K2][CO4] 1  
 (a) 0  
 (b) 1  
 (c) 2  
 (d) Error
- 1-h. Operator used to access union members: [K2][CO4] 1  
 (a) .  
 (b) ->  
 (c) \*  
 (d) &
- 1-i. File type allowing data to be added at the end without changing existing content [K2][CO5] 1  
 (a) Binary file  
 (b) Random Access file  
 (c) Append file  
 (d) Text file
- 1-j. Function reading a formatted input from file [K1][CO5] 1  
 (a) fgetc()  
 (b) fgets()  
 (c) fscanf()  
 (d) fread()

2. Attempt all parts:-

- 2.a. Describe the rules of defining name of any variable. [K2][CO1] 2  
 2.b. Demonstrate use of continue inside a loop with an example. [K3][CO2] 2  
 2.c. Define a pointer in C. Give an example of declaration. [K1][CO3] 2  
 2.d. Compare malloc() and realloc() in terms of usage. [K4][CO4] 2  
 2.e. Differentiate between text files and binary files in C. [K2][CO5] 2

### **SECTION-B**

30

3. Attempt all parts:-

3.a. Answer any one of the following:-

- 3.a.(i) Create an algorithm for swapping of two given numbers. [K3][CO1] 6

3.a.(ii)	Illustrate the operators and its types in C. [K2][CO1]	6
3.b.	Answer any one of the following:-	
3.b.(i)	Compare call by value and call by reference with suitable examples. [K4][CO2]	6
3.b.(ii)	Create a code to demonstrate the use of static keyword inside a function. [K3][CO2]	6
3.c.	Answer any one of the following:-	
3.c.(i)	Analyze how arrays are passed to functions. Create a code to illustrate. [K4][CO3]	6
3.c.(ii)	Explain Strings in C. Demonstrate different ways to initialize strings. [K2][CO3]	6
3.d.	Answer any one of the following:-	
3.d.(i)	Analyze the memory layout of a structure with members of different data types. [K4][CO4]	6
3.d.(ii)	Create a code to allocate memory for 10 integers using calloc(). Display the values. [K3][CO4]	6
3.e.	Answer any one of the following:-	
3.e.(i)	Describe the use and syntax of preprocessor directives like #include and #define. [K2][CO5]	6
3.e.(ii)	Explain fprintf() and fscanf() with example. [K3][CO5]	6
<b>SECTION-C</b>		<b>50</b>
4.	Answer any <u>one</u> of the following:-	
4-a.	Write a program to find area and perimeter of circle by using constant. [K3][CO1]	10
4-b.	Define Followings: Keywords, Escape sequences, Identifiers, Operators, Constant [K2][CO1]	10
5.	Answer any <u>one</u> of the following:-	
5-a.	Compare and justify the differences between auto, static, and extern variables in C with examples. [K4][CO2]	10
5-b.	Create a program to check whether a given year is a leap or not. [K3][CO2]	10
6.	Answer any <u>one</u> of the following:-	
6-a.	Describe 2-D array. Design a program using 2-D arrays to perform matrix multiplication. [K4][CO3]	10
6-b.	Define recursion. Create a code to find the factorial of a given number using recursive function. [K3][CO3]	10
7.	Answer any <u>one</u> of the following:-	
7-a.	Describe the main difference between structure and union with memory diagram. [K2][CO4]	10
7-b.	Create a C program that uses a union inside a structure to store student result information. The structure should contain the student's name and a union that can store either marks (integer) or percentage (float). Demonstrate how the program stores and displays both marks and percentage using the same memory location. [K3][CO4]	10
8.	Answer any <u>one</u> of the following:-	
8-a.	Demonstrate the handling of command-line arguments using argc and argv with examples. [K3][CO5]	10

8-b. Construct a program to count characters, words, and lines in a file. [K3][CO5]

10

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