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Printed Page:-4 **Subject Code:- CCSBS0103**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)
B.Tech
SEM: I - THEORY EXAMINATION (2025 - 2026)
Subject: Fundamentals of Computer Science

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. An error that does not stop program execution but gives wrong results is [CO1,K2] 1

(a) run-time error
(b) syntax error
(c) logical error
(d) linker error

1-b. A _____ is a directed graph that describes the flow of execution control of the program. [CO1,K1] 1

(a) Algorithm
(b) Hash Table
(c) Graph
(d) Flowchart

1-c. The smallest memory-consuming data type is [CO2,K2] 1

(a) int
(b) float
(c) double
(d) char

1-d. Assignment operator is evaluated [CO2,K2] 1

(a) left to right
(b) right to left
(c) randomly
(d) based on input

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1-e. Consider the following C code segment: 1

```
int i;
for(i = 1; i <= 5; i++) {
   if(i == 3)
      break;
   printf("%d ", i);
}
```

What will be the output of this program segment? [CO3,K3]

(a) 1 2 3
(b) 1 2
(c) 3
(d) 1 2 4 5

1-f. The else block in an if–else–if ladder is executed when [CO3,K3] 1

(a) program ends
(b) first condition is true
(c) any condition is true
(d) all conditions are false

1-g. Which operator accesses structure using pointer? [CO4,K1] 1

(a) *
(b) .
(c) ->
(d) &

1-h. Consider the following C code segment: 1

```
int a[] = {5, 10, 15};
printf("%d", sizeof(a)/sizeof(a[0]));
```

What will be the output of this program segment? [CO4,K3]

(a) 2
(b) 3
(c) 5
(d) 12

1-i. Consider the following C code segment: 1

```
FILE *fp;
fp = fopen("data.txt","r");
if(fp == NULL)
   printf("Error");
```

The condition `fp == NULL` indicates [CO5,K3]

(a) file opened successfully
(b) file closed
(c) file not found or error in opening
(d) file empty

1-j. Which function is used to reposition the file pointer in a file? [CO5,K1] 1

(a) fseek
(b) ftell

(c) rewind

(d) All

2. Attempt all parts:-

2.a.	State two key difference between sequential logic and decision-making. [CO1,K2]	2
2.b.	Compare and contrast the for loop and the while loop used in C programming. [CO2,K4]	2
2.c.	Distinguish between local variables and global variables in programming. [CO3,K2]	2
2.d.	How do you declare a basic structure in C? [CO4,K2]	2
2.e.	What is the purpose of the rewind() function in C file handling? [CO5,K2]	2

SECTION-B 30

3. Attempt all parts:-

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

3.a.(i)	Explain the purpose of compilers and interpreters in programming. How does a compiler differ from an interpreter? [CO1, K4]	6
3.a.(ii)	Explain the compilation and execution process of a C program in an IDE. Include the roles of compiler, linker, object code, and executable code. [CO1,K2]	6

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

3.b.(i)	Explain the concept of a nested for loop and write a C program to print the given pattern.[CO2,K3] * ** *** **** *****	6
3.b.(ii)	Illustrate the use of break and continue statements in a C program with suitable examples.. [CO2,K3]	6

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

3.c.(i)	Write a C program using a static variable to count the number of times a function is called. [CO3,K3]	6
3.c.(ii)	Explain the difference between parameter passing by value and by reference in C functions with examples. [CO3,K2]	6

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

3.d.(i)	Enumerate the various types of pointers in C and briefly explain each with suitable examples. [CO4, K2]	6
3.d.(ii)	Define an array and write a C program to find the sum of two n×n matrices using arrays.[CO4,K3]	6

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

3.e.(i)	Explain the basic low-level input/output system calls in UNIX, namely open, read, write, and close.[CO5,K1]	6
3.e.(ii)	Compare sequential file access and random file access in UNIX. Discuss their advantages and limitations. [CO5,K4]	6

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SECTION-C 50

4. Answer any one of the following:-

4-a. Explain the purpose of arithmetic, relational, logical, and bitwise operators in C. Give appropriate examples for each. [CO1,K2] 10

4-b. Explain variable naming rules in C. What is Hungarian Notation, and why is it used? [CO1,K2] 10

5. Answer any one of the following:-

5-a. Explain the while loop and write a C program to generate the Fibonacci series using a while loop. [CO2,K3] 10

5-b. Explain the various conditional statements used in programming and illustrate their use with appropriate examples.[CO2,K2] 10

6. Answer any one of the following:-

6-a. Discuss why iteration is generally preferred over recursion in programming. Also, write a C program using recursion to calculate the sum of natural numbers from 1 to n.[CO3,K3] 10

6-b. Explain what a preprocessor directive is in C .Discuss its purpose and explain the difference between file inclusion and macro definition with examples. [CO3,K2] 10

7. Answer any one of the following:-

7-a. Define a pointer and write a C program that uses pointers to calculate the sum and average of all elements in an array.[CO4,K3] 10

7-b. Write a C program to input N integers into an array and compute (i) the sum of odd numbers, (ii) the sum of even numbers, and (iii) the average of all the elements.[CO4,K3] 10

8. Answer any one of the following:-

8-a. Explain the concept of error handling in detail with a suitable example. Also, elaborate on the following terms: 10
1. exit() 2.perror() 3.errno.h
[CO5, K2]

8-b. Write a C program that reads a series of integers from a file named DATA and writes all positive numbers into a file named First and all negative numbers into a file named Second. [CO5,K3] 10