Reg. No. _____
(To be filled by the candidate)

21CS11
(2022 Batch Only)

COIMBATORE INSTITUTE OF TECHNOLOGY
(Government Aided Autonomous Institution)
COIMBATORE 641 014

B.Tech. DEGREE EXAMINATIONS, MARCH 2023
(First Semester)

ARTIFICIAL INTELLIGENCE AND DATA SCIENCE BRANCH

21CS11 C PROGRAMMING

Time : 3 Hours   Max:100 marks

INSTRUCTIONS
1.   Answer all questions in PART A and as per choice in PART B and PART C.

	PART – A	BTL	CO
	(10X2=20)		
1	Flowchart is a program design tool which depicts the appropriate steps to be followed in order to arrive at the solution to a problem. Are there any limitations of a flowchart? State any TWO (2) limitations of using flowchart.	LO	CO1
2	Construct an algorithm to print the following pattern. 1 1 1 2 2 3	LO	CO1
3	Define formatted input and output statements in C programming? Provide suitable examples.	LO	CO2
4	Differentiate between a for loop and a while loop with an examples.	LO	CO2
5	State the purpose of declaring an array? Is it necessary to mention the array size in C programming, if the answer is YES/NO, justify with valid reasons.	LO	CO3
6	How is a pointer initialized in C program? What is the relation between an array and a pointer?	LO	CO3

7	Find the output for the following C program
	main()
	{
	int x=10, y=15;
	x=x++;
	y=++y;
	printf("%d %d\n" ,x ,y);
	}
		LO	CO4

8	Define the purpose of '\0' is used in string operations with suitable example.	LO	CO4
9	List the benefit of using enum data type in C programming. Provide suitable example.	LO	CO5
10	State any TWO (2) difference between structure and union in C?	LO	CO5

PART – B

			(5 X 13 = 65)	Marks	BTL	CO
11	a.		Design a flowchart and write a pseudo code that asks the user to enter a year (a positive integer) and then prints out whether or not that year is a leap year. Here are the rules for determining whether or not a year is a leap year:	7	IO	CO1
			All years divisible by 4 EXCEPT those divisible by 100 and not divisible 400 are NOT leap years. (For example, 1700, 1800 and 1900 were not leap years, but 1996 and 2000 were.)			
	b.		Explain how procedural languages differs from object-oriented languages in programming ? State any TWO(2) common features of object-oriented programming.	6	IO	CO1

or algorithm (handwritten annotation above "code")

(OR)

12	a.	Top-down programming is a technique of programming that first defines the overall outline of the program and then complete the details. Describe the steps involved in top down analysis.	7	IO	CO1
	b.	Explain the concept of structured programming? Based on your understanding, state the properties of structured programming.	6	IO	CO1
13	a.	Program statement is a syntactic construction that performs an action when a program is executed. Explain the below program statements in C? 1. Declaration 2. Expression statement 3. Compound statement 4. Controlled Statement	7	IO	CO2
	b.	Explain the purpose of the switch statement with suitable example? What are labels i.e. case prefixes? What type of expression must be used to represent a case label	6	IO	CO2

(OR)

14	a.	Compare the use of the if-else statement with the use of "?" operator, based on your understanding, in what way can the "?" operator can be use in place of if-else statement?	7	IO	CO2
	b.	Armstrong numbers are those numbers in which the sum of digits raised to the power of a number of digits in that number will be equal to the number itself. Write a C program to print all armstrong numbers between 1 to 500.	6	IO	CO2
15	a.	Construct a C program to input number and find a largest digit in a given number and print it in word with appropriate message. (e.g. n=5273 – "SEVEN is largest")	7	IO	CO3
	b.	Explain the following string manipulation function available in string.h with suitable examples? a) String copy b) String concatenation c) String compare	6	IO	CO3

(OR)

16	a.	Explain in detail the usage of dynamic memory allocation and deallocation in C with examples?	7	IO	CO3
	b.	Briefly explain pointer arithmetic in C. Give an example code snippet involving pointers in which it would be inappropriate to use pointer arithmetic, and explain why?	6	IO	CO3
17	a.	C preprocessor is a program that processes program before it is passed to the compiler. List the features of C-preprocessor in C?	7	IO	CO4
	b.	Predict the output of the C program?	6	IO	CO4

```
#include<stdio.h>
int function();
main()
{
        int i;
        i = function();
        printf("%d", i);
        return 0;
}
function()
{
        int a;
        a = 250;
        return 0;
}
```

(OR)

18	a.	Explain the key concepts in function with suitable examples? Function declaration Function arguments Function pointers Recursive function	7	IO	CO4

Contd...

| 18. | b. | The Fibonacci sequence starts with the values 1, 1, 2, 3, 5, and 8. To get subsequent values in the sequence, you must add the two previous values. Thus, the term after 8 is 13, since 5+8 = 13. (And the term after that is 8+13 = 21.) In particular, the first number in the sequence is one, the second number is also one, the third number is two, the fourth number is three, the fifth number is five, etc. Write a function that calculates the nth Fibonacci number below | 6 | IO | CO4 |

| 19 | a. | Define a structure that can describe a hotel. It should have members that include name, address, grade, average room charge and the number of rooms. Write functions to perform the following operations:
1. To print the hotels of a given grade
2. To print the hotels with room charge less than a given value. | 7 | IO | CO5 |
| | b. | Write three lines of code: (1) declare a variable of type "struct soda" called coke. (2) Set the ~~red component of the~~ color ~~component~~ of coke to 7̄. (3) Set the name of the coke variable to "Coca-Cola ᴿᵉᵈ | 6 | IO | CO5 |

(OR)

| 20 | a. | Perform the following operatons in binary file.
1) Create Employee.dat file containing Employee Id, Name, Gender and Salary.
2) Display the count of Male and Female employees.
3) Delete all employess having salary greater than 90,000. | 7 | IO | CO5 |
| | b. | Differentiate between the following.
1) fread() and fscan()
2) fwrite() and fprintf()
3) fseek() and ftell() | 6 | IO | CO5 |

PART – C

(1 X 15 = 15)

			Marks	**BTL**	**CO**
21	a.	Write a program to check whether a string given by the user is a palindrome or not. (Palindrome: word or number that reads the same backward or forward, e.g. MADAM)	10	HO	CO3
	b.	Illustrate in detail the initialization of one-dimensional array, two-dimensional array and strings with suitable examples	5	HO	CO3

(OR)

| 22 | a. | Brief the concept of passing structures as function arguments and returning a structure from a function with an example? | 10 | HO | CO5 |
| | b. | Discuss in detail the ~~structure of array~~ with an examples. *array of structure* | 5 | HO | CO5 |

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