Integrated MCA I Semester 1

Subject Name: Problem Solving Using C - Practical **Subject Code:**IMCA13104

Type of course: Professional Core Course

Prerequisite (if any): -

List of Courses where this course will be prerequisite:

- Data Structure using C

Rationale: Problem Solving Using C helps understanding the nature of the problem at a deeper level through logical thinking. This helps the students to achieve proficiency in writing efficient code while developing solutions to the problems in computer science.

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks		Practical Marks		Total
L	T	P	C	TEE	CAT	TEP	CAP	
0	0	4	2	-	-	30	20	50

CAT: Continuous Assessment Theory comprised of CA1 and CA2 **CA1:** Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CAP:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

List of Practicals:

Sr. No.	Problem Statement
1	Write a program that works as a simple calculator.
2	Write a program to find area of triangle (a=h*b*0.5) where a=area, h=height, b =base.
3	Write a program to interchange two numbers.
4	Write a program to compute Fahrenheit from centigrade (f=1.8*c +32)
5	Write a program to find that the accepted number is Negative, or Positive or Zero.
6	Write a program to read three numbers from the keyboard and find out the maximum out of these three.
7	Write a program to check whether the entered character is capital, small letter, digit or any special character.
8	Write a program to read marks from the keyboard and your program should display equivalent grades according to the following table (if else ladder). Marks: Garde 100 - 80: Distinction 79-60: First 59-40: Second <40: Fail
9	Write a program to prepare payslips using the following data. Da = 10% of basic, Hra = 7.50% of basic, Ma = 300, Gross = basic + Da + Hra + Ma
10	Write a menu-driven program for scientific calculator using switch-case statements. (add, sub, multiplication, div, module, square, square root, power, log)

11	Write a program to print the sum of first n integer numbers.
12	Write a program to check if the entered character is a vowel or not.
13	Write a program to find out the Maximum and Minimum number from given 10 numbers using for, while loop.
14	Write a program to input an integer number and check if the last digit of the number is even or odd using any looping structure.
15	Write a program to print the sum of individual digits of a given integer using a while statement. (Use % operator)
16	Write a program to find out the sum of the first and last digit of a given number.
17	Write a program to check whether the given number is prime or not.
18	Write a program to print first n prime numbers.
19	Write a program to find the factorial of a given number.
20	Write a program to generate the first n number of Fibonacci series.
21	Write a program to find the sum and average of different numbers. The user should be able to enter as many numbers as he wants.
22	Write a program to accept start number and end number from the user and print all the numbers in the range.
23	Write a program to calculate average and total marks of 5 students for 3 subjects
24	Read five persons height and weight and count the number of persons having height greater than 170 and weight less than 50.
25	Write a program to find 1+1/2+1/3+1/4+....+1/n.
26	Write a program to find 1+1/2!+1/3!+1/4!+.....+1/n!.

27 Write a program to print following patterns:

*	*	* * * * *
* *	* *	* * * *
* * *	* * *	* * *
* * * *	* * * * *	* *
* * * * *	* * * * * *	*

28 Write a program to print following patterns.

1	12345	55555
12	1234	4444
123	123	333
1234	12	22
12345	1	1

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

29 Write a program to find which number is even or odd from a list of 10 numbers using an array.

30 Write a program to read & store the rollno & marks of 20 students using a 2-dimensional array.

31	Write a program to replace a character, to delete a character in a given string.
32	Write a program to reverse string.
33	Write a program that accepts a string and counts the number of space characters, tab character, new line character, and any other characters.
34	Write a program to check whether a given number is an Armstrong number or not using a user-defined function.
35	Write a program to check whether a given number is a palindrome or not using a user-defined function.
36	Write a program to find the Greatest Common Divisor (GCD) and Least Common Multiple (LCM) of two given numbers using user-defined functions.
37	Write a program to find the factorial of a number using recursion.
38	Define a structure data type called time_struct containing three - integer hour, integer
39	minute and integer second. Develop a program that would assign values to the individual number and display the time in the format: (16: 40: 51).
40	Define a structure called 'person' that contains the person's name, date of joining and salary. Using this structure, write a program to read personal information of 5 people and print the same on screen.
41	Define a structure called 'cricket' that describe the following information: Player name, Team name, Batting average Declare an array named player with 5 elements and write a C program to read the information about all the 5 players and print a team wise list containing names of players with their batting average.

Reference Books:

Sr. no.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1	Let Us C	Yashavant Kanetkar	BPB Publication ISBN: 9387284573	2016	15th Edition
2	The C Programming Language	Brian W. Kernighan and Dennis M. Ritchie	Prentice Hall of India, ISBN: 9332549443	2015	2nd Edition
3	Programming in ANSI C	E.Balagurusamy	Tata McGraw Hill ISBN: 935316513X	2019	8th Edition
4	Outline of Programming with C	Byron Gottfried, Schaum	McGraw-Hill ISBN: 9789353160272	2018	4th Edition
5	AICTE Prescribed - Programming for Problem Solving	R.S. Salaria	Khanna Book Publishing Co. ISBN: 939150521X	2022	1st Edition
6	C: The Complete Reference.	Herbert Schildt	Tata McGraw Hill ISBN: 9332585482	2017	4th Edition
7	Latest AICTE Syllabus Programming in C	Pradip Dey & Manas Ghosh	Oxford ISBN: 9780199491476	2018	-