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Table of Contents

Note : Remove “Table of Content” before including in CP Book
Each Course Plan shall be printed and made into a book with cover page
Blooms Level in all sections match with A.2, only if you plan to teach / learn at higher levels

18CPS13: C programming for problem Solving

A. COURSE INFORMATION

1. Course Overview

Degree:	B E	Program:	CS
Year / Semester :	2019/2	Academic Year:	2018-19
Course Title:	C programming for problem solving	Course Code:	18CPS13
Credit / L-T-P:	2-2-0	SEE Duration:	180 Minutes
Total Contact Hours:	40	SEE Marks:	60
CIA Marks:	40	Assignment	1 / Module
Course Plan Author:	LOKESH H D	Sign	Dt:
Checked By:		Sign	Dt:

2. Course Content

Module	Module Content	Teaching Hours	Module Concepts	Blooms Level
1	**Introduction to computer Hardware and software:** Computer generations, computer types, bits, bytes and words, CPU, Primary memory, Secondary memory, ports and connections, input devices, output devices, Computers in a network, Network hardware, Software basics, software types.	4	Computer Architecture	L2 Understand
	Overview of C: Basic structure of C program, executing a C program-Compilation and linking processes **Constant** such as Integer,Real,Floating point,character,string constants **variable**-variable declaration and Initialization **data types-**Void,Integer,Floating Point,Character,Logical data **Operators and expressions**	4	C program structure	L2 Understand
2	**Managing Input and output operations**-Introduction,Reading a character,writing a character,Formatted input and Formatted output,sample program	4	Standard Input & Output library	L2 Understand
	Decision Making-Introduction,Decision making with IF statements,SWITCH statements,Break statements,Continue statements and GOTO statements **Branching and Looping**- Introduction,WHILE statements,Do-While,Switch statements,If-Then-else and its sample programs Finding roots of a quadratic equation, computation of binomial coefficients, plotting of Pascals triangle.	4	Program constructs	L2 Understand
3	**Arrays**: Arrays (1-Dimensional, 2-Dimensional),Declaration, Characteristics, Initialization, Character arrays and Strings	4	Structured data representation	L2 Understand
	Basic Algorithms: Searching and Sorting Algorithms (Linear search, Binary search, Bubble sort and Selection sort).	4	data arrangement & probing	L3 Apply
4	**User Defined Functions**-Introduction, Elements of function, Types of functions, Function Prototype	4	Modular programming	L2 Understand
	Recursion-Definition, Example programs, Finding Factorial of a positive integers and Fibonacci series	4	Recursion	L3 Apply
5	**Structure-**Definition,declaration of structures,Initialization,structure within structure,array of structures,pointer to structures	4	User-defined datatype	L3 Apply
	Pointers-Definition, declaration of pointers, Initialization of pointers,Accessing a variable,Array of pointers, pointers and structures,void pointers, sample programs Preprocessor Directives- macro substitution,inclusion	4	Memory representation	L3 Apply

3. Course Material

Module	Details	Available
1,2,34	Text Books	
	1. E. Balaguruswamy,Programming in ANSI C, 7th Edition,Tata McGraw-Hill	Not Available (material requirement given)
	2. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.	Available
2	Reference books	
	1. Sumitabha Das, Computer Fundamentals & C Programming, Mc Graw Hill Education. 2. Gary J Bronson, ANSI C Programming, 4 th Edition, Ceneage Learning. 3. Vikas Gupta: Computer Concepts and C Programming, Dreamtech Press 2013. 4. R S Bichkar, Programming with C, University Press, 2012. 5. V Rajaraman: Computer Programming in C, PHI, 2013. 6. Basavaraj S. Anami, Shanmukhappa A Angadi, Sunilkumar S. Manvi, Computer Concepts and C Programming: A Holistic Approach to Learning C, Second edition, PHI India, 2010.	Available
3	Others (Web, Video, Simulation, Notes etc.)	Available
	https://www.tutorialspoint.com/PPS	
	https://vtuplanet.com/notes	
	https;//www.khanacademy.com	

4. Course Prerequisites

SNo	Course Code	Course Name	Module / Topic / Description	Sem	Remarks	Blooms Level
1	18CPS27	C Programming for problem solving	Familiarize with fundamentals of basics of computer concepts	2	Required for Module 1	l1
	-	-		-		

Note: If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.

B. OBE PARAMETERS

1. Course Outcomes

#	COs	Teach. Hours	Concept	Instr Method	Assessment Method	Blooms' Level
18CPS23.1	Understand the working of Computer System	04	Computer Architecture	Lecture	Question& Answer Assignment	L2 Understand
18CPS23.2	Understand the procedure to write a C program and usage of Variables & Operators	04	C program structure	Lecture	Question & Answer Assignment	L2 Understand
18CPS23.3	Understand to read and write the data using Input & Output library functions	04	Standard Input & Output library Question & Answer Assignment	Lecture	Question & Answer Assignment	L2 Understand

18CPS23.4	Understand to construct a programming solution to a given problem using Branching & Looping constructs	04	Program constructs	Lecture	Question & Answer Assignment	L2 Understand
18CPS23.5	Describe the linear representation of data using arrays	04	Structured data representation	Lecture	Question & Answer Assignment	L2 Understand
18CPS23.6	Develop Algorithms for data arrangement & probing using Searching & Sorting technique	04	data arrangement & probing	Lecture	Question & Answer Assignment	L3 Apply
18CPS23.7	Understand Modular representation of program using User-Defined functions	04	Modular programming	Lecture	Question & Answer Assignment	L2 Understand
18CPS23.8	Develop a C program using Recursion	04	Recursion	Lecture	Question & Answer Assignment	L3 Apply
18CPS23.9	Develop a C program to store the data of different types using structures	04	User-defined datatype	Lecture	Question & Answer Assignment	L3 Apply
18CPS23.10	Develop a C program to store the address of a variable using Pointers	04	Memory representation	Lecture	Question & Answer Assignment	L3 Apply
-	**Total**	**40**	-	-	-	-

Note: Identify a max of 2 Concepts per Module. Write 1 CO per concept.

2. Course Applications

SNo	Application Area	CO	Level
1	web applications, development tools, image editing programs, and communication programs	CO1	L2
2	To create computer applications,embedded softwares	CO2	L2
3	Computer-aided design,graphical user interfaces,image processing	CO3	L2
4	banking sectors,Theory of Algebra,In Number theory ,DNA sequences	CO4	L2
5	Computer Graphics,Database Management system	CO5	L2
6	Banking sectors	CO6	L3
7	Database Management system	CO7	L2
8	Combinatorial problems,Dynamic programming	CO8	L3
9	Computer Architecture	CO9	L3
10	System programming	CO10	L3

Note: Write 1 or 2 applications per CO.

3. Articulation Matrix

(CO – PO MAPPING)

-	Course Outcomes	Program Outcomes												
#	COs	PO1	PO2	PO3	PO4	PO5	PO 6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	Level
18CPS23.1	Understand the working of computer system	2												L2
18CPS23.2	Understand the procedure to write a C program using operators and expressions	1												L2
18CPS23.3	Understand to read and write the data using Input & Output library functions	1												L2
18CPS23.4	Understand to construct a programming solution to a given problem using Branching &	1	2											L2

	Looping constructs													
18CPS23.5	Describe the linear representation of data using arrays	1	2	3										L2
18CPS23.6	Develop Algorithms for data arrangement & probing using Searching & Sorting technique	1	3	3										L3
18CPS23.7	Understand Modular representation of program using User-Defined functions	1	2	2										L2
18CPS23.8	Develop a C program using Recursion	1	2	3										L3
18CPS23.9	Develop a C program to store the data of different types using structures	1	2	3										L3
18CPS23.10	Develop a C program to store the address of a variable using Pointers	1	2	3										L3
18CPS28	Average													
Note: Mention the mapping strength as 1, 2, or 3														

4. Mapping Justification

Mapping		Justification	Mapping Level
CO	**PO**	**-**	**-**
CO1	PO1	Knowledge of Basic parts of Computer, and its working is discussed.	2
	PO2	No Analyzing. No mapping	-
	PO3	No design &development content, No mapping, Attainment will be Zero, if mapping done.	-
	PO4	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	-
	PO5	No tool content. No mapping	-
	PO6	No social, cultural issues. No mapping	-
	PO7	No impact on Environment and sustainability. No mapping	-
	PO8	No team work or lead for the ethical work. No mapping	-
	PO9	No team work or lead for the ethical work. No mapping	-
	PO10	No usage for communication. No mapping.	-
	PO11	No project management and finance. No mapping.	-
	PO12	No mapping as there is only understanding	-
CO2	PO1	Basic Structure of C program and its Concepts are discussed.	1
	PO2	No Analyzing. No mapping	-
	PO3	No design &development content, No mapping, Attainment will be Zero, if mapping done.	-
	PO4	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	-
	PO5	No tool content. No mapping	-
	PO6	No social, cultural issues. No mapping	-
	PO7	No impact on Environment and sustainability. No mapping	-
	PO8	No team work or lead for the ethical work. No mapping	-
	PO9	No team work or lead for the ethical work. No mapping	-
	PO10	No usage for communication. No mapping.	-
	PO11	No project management and finance. No mapping.	-
	PO12	No mapping as there is only understanding	-
CO3	PO1	Understanding the procedures to read and write I/O functions	1
	PO2	No Analyzing. No mapping	-

	PO3	No design &development content, No mapping, Attainment will be Zero, if mapping done.	-
	PO4	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	-
	PO5	No tool content. No mapping	-
	PO6	No social, cultural issues. No mapping	-
	PO7	No impact on Environment and sustainability. No mapping	-
	PO8	No team work or lead for the ethical work. No mapping	-
	PO9	No team work or lead for the ethical work. No mapping	-
	PO10	No usage for communication. No mapping.	-
	PO11	No project management and finance. No mapping.	-
	PO12	No mapping as there is only understanding	-
CO4	PO1	Understanding the Concepts of C Language	1
	PO2	analyze the problem to use relevant Branching and looping Constructs	2
	PO3	No design &development content, No mapping, Attainment will be Zero, if mapping done.	-
	PO4	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	-
	PO5	No tool content. No mapping	-
	PO6	No social, cultural issues. No mapping	-
	PO7	No impact on Environment and sustainability. No mapping	-
	PO8	No team work or lead for the ethical work. No mapping	-
	PO9	No team work or lead for the ethical work. No mapping	-
	PO10	No usage for communication. No mapping.	-
	PO11	No project management and finance. No mapping.	-
	PO12	No mapping as there is only understanding	-
CO5	PO1	Understanding the Concepts of arrays	1
	PO2	analyse the problem by using the knowledge of arrays	2
	PO3	design and develop the program requires the knowledge of arrays.	3
	PO4	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	-
	PO5	No tool content. No mapping	-
	PO6	No social, cultural issues. No mapping	-
	PO7	No impact on Environment and sustainability. No mapping	-
	PO8	No team work or lead for the ethical work. No mapping	-
	PO9	No team work or lead for the ethical work. No mapping	-
	PO10	No usage for communication. No mapping.	-
	PO11	No project management and finance. No mapping.	-
	PO12	No mapping as there is only understanding	-
CO6	PO1	Understanding the Concepts of arrays	1
	PO2	analyse the problem by using the knowledge of arrays	3
	PO3	design and develop the algorithms for sorting and searching techniques	3
	PO4	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	-
	PO5	No tool content. No mapping	-
	PO6	No social, cultural issues. No mapping	-
	PO7	No impact on Environment and sustainability. No mapping	-
	PO8	No team work or lead for the ethical work. No mapping	-
	PO9	No team work or lead for the ethical work. No mapping	-
	PO10	No usage for communication. No mapping.	-
	PO11	No project management and finance. No mapping.	-
	PO12	No mapping as there is only understanding	-
CO7	PO1	Understanding the modular representation of a program,,	1

	PO2	analyze the problem requires the knowledge of elements of functions	2
	PO3	Design and develop the program requires the knowledge of functions	2
	PO4	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	-
	PO5	No tool content. No mapping	-
	PO6	No social, cultural issues. No mapping	-
	PO7	No impact on Environment and sustainability. No mapping	-
	PO8	No team work or lead for the ethical work. No mapping	-
	PO9	No team work or lead for the ethical work. No mapping	-
	PO10	No usage for communication. No mapping.	-
	PO11	No project management and finance. No mapping.	-
	PO12	No mapping as there is only understanding	-
CO8	PO1	Understanding the Concept of recursion,,.	1
	PO2	analyze the problem requires the knowledge of elements of functions	2
	PO3	Design and develop the program requires the knowledge of recursion	3
	PO4	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	-
	PO5	No tool content. No mapping	-
	PO6	No social, cultural issues. No mapping	-
	PO7	No impact on Environment and sustainability. No mapping	-
	PO8	No team work or lead for the ethical work. No mapping	-
	PO9	No team work or lead for the ethical work. No mapping	-
	PO10	No usage for communication. No mapping.	-
	PO11	No project management and finance. No mapping.	-
	PO12	No mapping as there is only understanding	-
CO9	PO1	Understanding the Concept of Structures	1
	PO2	analyze the problem requires the knowledge of elements of Structures	2
	PO3	Design and develop the program requires the knowledge of Structures	3
	PO4	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	-
	PO5	No tool content. No mapping	-
	PO6	No social, cultural issues. No mapping	-
	PO7	No impact on Environment and sustainability. No mapping	-
	PO8	No team work or lead for the ethical work. No mapping	-
	PO9	No team work or lead for the ethical work. No mapping	-
	PO10	No usage for communication. No mapping.	-
	PO11	No project management and finance. No mapping.	-
	PO12	No mapping as there is only understanding	-
CO10	PO1	Understanding the Concept of Pointers	1
	PO2	analyze the problem requires the knowledge of Pointers	2
	PO3	Design and develop the program requires the knowledge of Pointers	3
	PO4	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	-
	PO5	No tool content. No mapping	-
	PO6	No social, cultural issues. No mapping	-
	PO7	No impact on Environment and sustainability. No mapping	-
	PO8	No team work or lead for the ethical work. No mapping	-
	PO9	No team work or lead for the ethical work. No mapping	-
	PO10	No usage for communication. No mapping.	-

	PO11	No project management and finance. No mapping.	-
	PO12	No mapping as there is only understanding.	-

Note: Write justification for each CO-PO mapping.

5. Curricular Gap and Content

SNo	Gap Topic	Actions Planned	Schedule Planned	Resources Person	PO Mapping
1					
2					
3					
4					
5					

Note: Write Gap topics from A.4 and add others also.

6. Content Beyond Syllabus

SNo	Gap Topic	Actions Planned	Schedule Planned	Resources Person	PO Mapping
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Note: Anything not covered above is included here.

C. COURSE ASSESSMENT

1. Course Coverage

Module #	Title	Teaching Hours	No. of question in Exam						CO	Levels
			CIA-1	CIA-2	CIA-3	Asg	Extra Asg	SEE		
1	Introduction to computer Hardware and Software,Overview of C	08	2	-	-	1	-	2	CO1, CO2	L2, L2
2	Managing Input and output operations,Conditional Branching and loops	08	2	-	-	1	-	2	CO3, CO4	L2
3	Arrays, Basic algorithms	08	-	2	-	1	-	2	CO5, CO6	L2, L3
4	User-defined functions and Recursion	08	-	2		1	-	2	CO7, Co8	L2, L3
5	Structures and Pointers, Preprocessor Directives	08	-	-	4	1	-	2	CO9, CO10	L3
-	**Total**	**40**	**4**	**4**	**4**	**5**	**-**	**10**	**-**	**-**

Note: Distinct assignment for each student. 1 Assignment per chapter per student. 1 seminar per test per student.

2. Continuous Internal Assessment (CIA)

Evaluation	Weightage in Marks	CO	Levels
CIA Exam – 1	30	CO1, CO2, CO3, CO4	L2, L2, L2, L2
CIA Exam – 2	30	CO5, CO6, CO7, C08	L2, L3, L2, L3
CIA Exam – 3	30	CO9, CO10	L3, L3
Assignment - 1	10	CO1, CO2, CO3, CO4	L2, L2, L2, L2
Assignment - 2	10	CO5, CO6, CO7, C08	L2, L3, L2, L3
Assignment - 3	10	CO9, CO10	L3, L3
Seminar - 1	-	-	-
Seminar - 2	-	-	-
Seminar - 3	-	-	-
Other Activities – define – Slip test	-	-	-
Final CIA Marks	**40**	**-**	**-**

Note : Blooms Level in last column shall match with A.2 above.

D1. TEACHING PLAN - 1

Module - 1

Title:	Introduction to computer Hardware and Software,Overview of C	Appr Time:	08 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Understand the working of computer system	CO1	L2
2	Understand the procedure to write a C program using operators and expressions	CO2	L2
b	***Course Schedule***	-	-
Class No	**Module Content Covered**	**CO**	**Level**
1	Introduction to computer Hardware and software: Computer generations	C01	L1
2	computer types, bits,bytes and words, CPU	C01	L2
3	Primary memory, Secondary memory,ports and connections, input devices	C01	L2
4	output devices, Computers in a network	C01	L2
5	Network hardware, Software basics, software types	C01	L2
6	Overview of C: Basic structure of C program	C02	L2
7	executing a C program	C02	L2
8	Constant	C02	L2
9	variable	C02	L2
10	data types	C02	L2
11	Operators and expressions	C02	L2
c	**Application Areas**	**CO**	**Level**
1	web applications, development tools, image editing programs, and communication programs	CO1	L2
2	To create computer applications,embedded softwares	CO2	L2
d	**Review Questions**	-	-
1	What is a Computer? Explain the parts of Computer.	CO1	L1
2	Define i) bits ii) bytes iii)words	CO1	L1
3	Explain Input and Output devices in detail.	CO1	L2

4	List and explain basic components of computer network.	CO1	L2
5	Define Software. Explain its types.	CO1	L2
6	What is a token? What are different types of tokens available in C language? explain	CO2	L2
7	Explain structure of C program with an example.	CO2	L2
8	Define: i) variable ii) Constant iii) Associativity iv) precedence.	CO2	L2
9	Explain any five operators used in C language.	CO2	L2
10	What are datatypes? Mention the different datatypes supported by C language, giving an example to each.	CO2	L2
11	Write a C program to find area of a circle.	CO2	L2
12	What is an algorithm? Write an algorithm to find largest of 3 numbers	CO2	L2
13	Convert the following mathematical expressions into C equivalent: i) area=$\sqrt{s(s-a)(s-b)(s-c)}$ ii) x= -b + $\sqrt{b2-4ac}$/2a	CO2	L2
e	**Experiences**	-	-
1			
2			
3			
4			

Module – 2

Title:	Managing Input and output operations, Conditional Branching and loops	Appr Time:	10 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Understand to read and write the data using Input & Output library functions	CO3	L2
2	Understand to construct a programming solution to a given problem using Branching & Looping constructs	CO4	L2
b	***Course Schedule***	-	-
Class No	**Module Content Covered**	**CO**	**Level**
12	Managing Input and output operations,Introduction	CO3	L2
13	Reading a character,writing a character	CO3	L2
14	Formatted input and Formatted output,sample program	CO3	L2
15	Formatted input and Formatted output,sample program	CO3	L2
16	Decision Making-Introduction,Decision making with IF statements,SWITCH statements,Break statements,Continue statements and GOTO statements	CO4	L2
17	Branching and Looping- Introduction,WHILE statements,Do-While,Switch statements,If-Then-else and its sample programs	CO4	L2
18	Finding roots of a quadratic equations	CO4	L2
19	computation of binomial coefficients	CO4	L2
20	plotting of Pascals triangle.	CO4	L2
c	**Application Areas**	**CO**	**Level**
1	Computer-aided design,graphical user interfaces,image processing	CO3	L2
2	banking sectors,Theory of Algebra,In Number theory ,DNA sequences	CO4	L2
d	**Review Questions**	-	-
14	Explain printf and scanf functions with example	CO3	L2
15	List all the conditional control statements used in C. Write a C program to find the biggest of three numbers.	CO4	L2
16	Implement a C program to find the reverse of an integer number and check whether it is palindrome or not	CO3	L2

17	Explain SWITCH statement, with syntax and example	CO4	L2
18	Differentiate between WHILE and DO-WHILE loops	CO4	L2
19	Develop a C program to read a year as an input and find whether it is Leap or not	CO4	L2
20	Explain the syntax of WHILE statement. Write a C program to check the given number is palindrome or not	CO4	L2
21	Distinguish between the following: i) goto and if ii) break and continue	CO4	L2
22	List all the branching statements and Looping statements	CO4	L2
23	List all unconditional statements and explain with syntax	CO4	L2
e	**Experiences**		
1			
2			
3			
4			
5			

E1. CIA EXAM – 1

a. Model Question Paper - 1

Crs Code:	18CPS23	Sem:	2	Marks:	30	Time:	90 minutes
Course:	C programming for problem solving						

-	-	**Note: Answer any ONE FULL question from each Module, each carry equal marks.**	**Marks**	**CO**	**Level**
		MODULE-1			
1	a	What is Computer? Explain its parts.	03	CO1	L1
	b	Explain primary and secondary memory devices in detail.	04	CO1	L2
	c	List all operators supported in C. Explain relational, logical and bitwise operator with example.	05	CO2	L2
	d	Write a C program to find the area of triangle, when we know the length of all three sides.	03	CO2	L2
		OR			
2	a	Explain input and output devices with example	04	CO1	L2
	b	Explain different network topologies with relevant diagram	05	CO1	L2
	c	What is a variable? Explain the rules for constructing variables in c language	04	CO2	L2
	d	Convert the following mathematical expressions into C expressions: I) $\frac{x}{b+c}+\frac{y}{b-c}$ ii) a $+\frac{b(ad+e)}{b-a}-\frac{c}{d}$	02	CO2	L2
		MODULE-2			
3	a	Explain with syntax and example: i) Input() ii) Output()	04	CO3	L2
	b	Explain the two way selection(if,if-else, nested if-else, cascaded if-else) in C language with syntax	04	CO4	L2
	c	Write a program to find area and perimeter of a circle	03	CO4	L2
	d	Using Switch statement implement simple calculator program	04	CO4	L2
		OR			
4	a	Write the guidelines to use scanf() & printf() functions in C language	03	CO3	L2
	b	Write a C program to find the roots of Quadratic equation	04	CO4	L2
	c	What is a loop? Explain the different loops in C language	04	CO4	L2
	d	Write a C program to compute binomial coefficients	04	CO4	L2

b. Assignment -1

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions							
Crs Code:	18CPS23	Sem:	2	Marks:	5 / 10	Time:	90 – 120 minutes

Course:	C programming for problem solving		

Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.

SNo	USN	Assignment Description	Marks	CO	Level
1		Write a note on generations of computer.		CO1	L1
2		Explain input and Output Devices in detail.		CO1	L2
3		Explain Primary memory and secondary memory storage.		CO1	L2
4		Explain Network Typologies		CO1	L2
5		Define the following: i) bits ii) bytes iii) words		CO1	L2
6		Define Software. Explain its types.		CO1	L2
7		Write basic structure of C program and explain its different sections.		CO2	L2
8		What are the rules to be followed to declare an identifier with example.		CO2	L2
9		Define C tokens. List and explain different c-tokens.		CO2	L2
10		List and Explain all the operators supported in C with an example.		CO2	L2
11		Evaluate the following expressions: i) 100% 20<=20-5 + 100% 10 – 20 == 5 >=1!=20 ii) a+=b *=c -=5 where a = 3 b=5 and c=8		CO2	L2
12		write a C program to demonstrate working of these logical operators.		CO2	L2
13		Explain formatted input output statements in C with syntax and example. Write a C program to find the area and perimeter of a rectangle		CO3	L2
14		What is two-way selection statement? Explain if, if else and cascaded if-else with examples.		CO4	L2
15		Explain the different types of loops used in C with syntax and example for each		CO4	L2
16		Explain the use of break and continue statement in loops with example		CO4	L2
17		Explain the Switch statement with syntax and example		CO4	L2
18		Explain Ternary operator with suitable example		CO4	L2
19		Write a C program to find the roots of Quadratic equation.		CO4	L2
20		Write a C program to convert a decimal number to binary form		CO4	L2
21		Write a C program to find the sum of series $1+x+x^2+x^3+\ldots.+x^n$		CO4	L2
22		Write a C program to plot a Pascals triangle		CO4	L2

D2. TEACHING PLAN -2

Module – 3

Title:	Arrays, Character arrays and strings, Basic Algorithms	Appr Time:	08Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Describe the linear representation of data using arrays	CO5	L2
2	Develop Algorithms for data arrangement & probing using Searching & Sorting technique	CO6	L3
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**
21	Arrays(1-Dimensional,2 Dimensional),Declaration,Characteristics,Initialization	CO5	L2
22	Character arrays	CO5	L2
23	Declaration and Initialization of Strings	CO5	L2
24	Display of strings with different formats	CO5	L2
25	string standard functions,	CO5	L2

26	string arrays	CO5	L2
27	Searching and Sorting Algorithms -Linear search	CO6	L3
28	Binary search	CO6	L3
29	Bubble sort	CO6	L3
30	Selection sort	CO6	L3
c	**Application Areas**	**CO**	**Level**
1	Computer Graphics,Database Management system	CO5	L2
2	Banking sectors	CO6	L3
d	**Review Questions**	-	-
1	What is an ARRAY? Explain the different ways of initializing an array with example	CO5	L2
2	Write a C program to find sum of array elements by passing array as function argument	CO5	L3
3	Explain the different ways of declaring an array with example	CO5	L2
4	Explain any four string manipulation library function with example	CO5	L2
5	What is string? Write a C program that reads a sentence and prints the frequency of each of the vowels and total count of consonants	CO5	L3
6	Write a C program to search a name in a list of names using Binary Searching technique	CO6	L3
7	Write a C program to sort the given array elements in ascending order by selection sort	CO6	L3
8	Write a C program to concatenate two strings without using built-in function strcat()	CO5	L3
9	Explain with program: i) String Reverse ii) String Copy iii) String Compare	CO5	L2
10	Write a C program to implement string copy operation STRCOPY(str1,str2) that copies a string str1 to another str2 without using Library function	CO5	L3
e	**Experiences**	-	-
1			
2			
3			
4			
5			

Module – 4

Title:	User Defined Functions and Recursion	Appr Time:	08 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Understand Modular representation of program using User-Defined functions	CO7	L2
2	Develop a C program using Recursion	CO8	L3
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**
31	Introduction, Elements of function	CO7	L2
32	Types of functions	CO7	L2
33	Function Prototype	CO7	L2
34	Recursion-Definition	CO8	L3
35	Example programs using recursion	CO8	L3
36	Finding Factorial of a positive integers	CO8	L3
37	Finding Fibonacci series of a number using recursion	CO8	L3
c	**Application Areas**	**CO**	**Level**

1	Database Management system	CO7	L3
2	Combinatorial problems,Dynamic programming	CO8	L3
d	**Review Questions**	-	-
11	Define User-defined function? Write a function to find the sum of two numbers	CO7	L2
12	Write a C program that invokes the function isprime() that accepts an integer argument and returns 1 if argument is isprime() else 0	CO7	L3
13	Explain the types of function based on parameters	CO7	L2
14	Define the following: i) Actual parameter ii) Formal parameter	CO7	L2
15	Explain with example to each i) function call ii) function definition iii) function prototype	CO7	L2
16	Write a function power that computes x raised to the power y for integers x and y and returns double type value	CO7	L3
17	Write a C program to find the square root of a given number N using user defined function	CO7	L3
18	Write a C program to compute sin(x) using Taylor series.	CO7	L3
19	Define Recursion. Write a C program to find the fibonacci series using recursion	CO8	L3
20	Write a C program to find the factorial of a given number.	CO8	L3
e	**Experiences**	-	-
1		CO7	L2
2			
3			
4		CO8	L3
5			

E2. CIA EXAM – 2

a. Model Question Paper - 2

Crs Code:	18CPS23	Sem:	2	Marks:	30	Time:	90 minutes
Course:	C programming for problem solving						

-	-	**Note: Answer any ONE FULL question from each Module, each carry equal marks.**	**Marks**	**CO**	**Level**
		MODULE-3			
1	a	What is an array? Explain different methods of initialization and declaration of one dimensional array	03	CO5	L2
	b	Write a C program to implement Matrix multiplication using two dimensional arrays	04	CO5	L3
	c	Write a C program to concatenate 2 strings without using Built-in function	05	CO5	L3
	d	List different types of searching techniques and explain any one	03	CO6	L2
		OR			
2	a	What is an array? Explain different methods of initialization and declaration of two dimensional array	04	CO5	L2
	b	Write a C program to sort the given array elements in descending order using bubble sort	05	CO5	L3
	c	Explain all String manipulation library functions with examples	04	CO5	L2
	d	List different types of sorting techniques and explain any one	02	CO6	L2
		MODULE-4			
3	a	What is a function? Explain two categories of argument passing techniques with examples	04	CO7	L2
	b	Explain the following with an example: i)function call ii) function definition iii) function prototype	03	CO7	L2
	c	Write a C program to find the sum of array elements by passing array as	04	CO7	L3

		function argument			
	d	Write a C program to find factorial of a positive integer	04	CO8	L3
		OR			
4	a	What are actual and formal parameters	03	CO7	L2
	b	Write a C program to implement string operations without using built-in functions	04	CO7	L3
	c	Write a C program to implement Tower of hanoi using recursion	04	CO8	L3
	d	Write a C program to find prime or not using Recursion	04	CO8	L3

b. Assignment – 2

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions							
Crs Code:	18CPS23	Sem:	2	Marks:	5 / 10	Time:	90 – 120 minutes
Course:	C Programming for Problem Solving						

Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.

SNo	USN	Assignment Description	Marks	CO	Level
1		What is an array? Explain the declaration and initialization of one dimensional arrays with example		CO5	L2
2		Explain the declaration and initialization of two dimensional arrays with example		CO5	L2
3		Write a C program to read N integers into an array A and to i)find the sum of odd numbers ii) find the sum of even numbers iii) find the average of all numbers Output the results computed with appropriate headings		CO5	L3
4		How string is declared and Initialized? Explain any Four string manipulation functions with examples		CO5	L2
5		Write a C Program to sort the given array elements in ascending order by Bubble sort technique		CO6	L3
6		Write a C Program to search a key element in an array using linear search technique		CO6	L3
7		What is function? Explain two categories of argument passing techniques with examples		CO7	L2
8		Write a C program to find cube of a number using function		CO7	L3
9		Explain the elements of User defined function		CO7	L2
10		Explain function call, function definition and function prototype with example to each		CO7	L2
11		What are actual parameters and formal parameters? Illustrate with example		CO7	L2
12		What is recursion? Write a C program to compute the factorial of a given number 'n' using recursion		CO8	L3
13		Write a C program to compute polynomial coefficient ${}^{n}C_{r}$ using recursion		CO8	L3

D3. TEACHING PLAN - 3

Module – 5

Title:	Structure and Pointers,Preprocessor Directives	Appr Time:	08 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Develop a C program to store the data of different types using structures	CO9	L3
2	Develop a C program to store the address of a variable using Pointers and usage of Preprocessor directives	CO10	L3
b	***Course Schedule***		
Class No	**Module Content Covered**	**CO**	**Level**

38	Structure Definition, declaration of structures	CO9	L3
39	Initialization,structure within structure	CO9	L3
40	array of structures,pointer to structures	CO9	L3
41	Pointer Definition, declaration of pointers	CO10	L3
42	Initialization of pointers,Accessing a variable	CO10	L3
43	Array of pointers,pointers and structures	CO10	L3
44	void pointers,sample programs	CO10	L3
45	Preprocessor Directives- macro substitution,inclusion	CO10	L3
c	**Application Areas**	**CO**	**Level**
1	Computer Architecture	CO9	L3
2	System programming	CO10	L3
d	**Review Questions**	-	-
1	What is structure? Explain its declaration and initialization with an example	CO9	L3
2	Write a C program to pass structure variable as function arguments	CO9	L3
3	Write a note on the following with an example for each: I) Arrays of structures ii) arrays within structures iii) structures within structures	CO9	L3
4	Show how a structure variable is passed as a parameter to a function,with an example	CO9	L3
5	How structure is different from an array? Explain declaration of structure with an example	CO9	L3
6	Define point variable. Explain with an example, the declaration and Initialization of variable	CO10	L3
7	Write the difference between array and structure	CO9	L3
8	Give the advantages and disadvantages of pointer datatype	CO10	L3
9	Write and Explain any five preprocessor directives in C	CO10	L3
10	Explain malloc(),calloc() functions with examples	CO10	L3
e	**Experiences**	-	-
1			
2			
3			
4			
5			

E3. CIA EXAM – 3

a. Model Question Paper - 3

Crs Code:	18CPS23	Sem:	2	Marks:	30	Time:	90 minutes
Course:	C Programming for Problem Solving						

-	-	**Note: Answer any ONE FULL question from each Module, each carry equal marks.**	**Marks**	**CO**	**Level**
		MODULE-5			
1	a	Define structure? Write a C program to store and print name,USN,subject and IA marks of students using structure	05	CO9	L3
	b	Explain array of pointers with example	05	CO10	L3
	c	Explain #define and #include preprocessor directives	05	CO10	L3
		OR			
2	a	Explain the C syntax of structure declaration and initialization with an example	05	CO9	L3
	b	Explain how the structure variable passed as a parameter to a function with example	06	CO9	L3
	c	Explain with syntax: i) fputs() ii) fgets() iii) fgetc() iv) fputc()	04	CO10	L3

		MODULE-5			
3	a	Give advantages and disadvantages of pointers in C. Write a program in C to find the sum ,mean and standard deviation of all elements of array using pointer technology	10	CO10	L3
	b	Explain any five preprocessor directives in C	05	CO10	L3
		OR			
4	a	Define pointer. Explain with an examples with declaration and Initialization of a pointer variable	05	CO10	L3
	b	Write a C program to swap two numbers using call by pointers(address) method	05	CO10	L3
	c	Define file. Explain all file operations with syntax and example	05	CO10	L3

b. Assignment – 3

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions							
Crs Code:	18CPS23	Sem:	2	Marks:	5 / 10	Time:	90 – 120 minutes
Course:	C Programming for Problem Solving						
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.							

SNo	USN	Assignment Description	Marks	CO	Level
1		What is Structured datatype? Explain		CO9	L3
2		Explain the concept of array of structures, with a suitable C program		CO9	L3
3		Write a C program to maintain a record of 'n' employee detail using an array of structures with three fields (id,name,salary) and print the details of employees whose salary is above Rs.10,000		CO9	L3
4		Explain structure within structure with an example		CO9	L3
5		What is a pointer? Write a C program to find the sum and mean of all elements in an array using pointers		CO10	L3
6		Write a C program to swap two numbers using call by pointer method		CO10	L3
7		Explain how pointers and arrays are related with example		CO10	L3
8		What is a file? Explain fopen and fclose functions		CO10	L3
9		Explain fgets and fputs functions		CO10	L3
10		Write a C program to copy one file to another file without using built in function		CO10	L3

F. EXAM PREPARATION

1. University Model Question Paper

Course:	C Programming for Problem Solving					Month / Year	Mar /2019
Crs Code:	18CPS23	Sem:	2	Marks:	100	Time:	180 minutes

-	Note	Answer all FIVE full questions. All questions carry equal marks.	Marks	CO	Level
1	a	Explain the components required to process the data in a computer	04	CO1	L1
	b	What is the need of network topologies. Explain the following network topologies i) Bus topology ii) star topology iii) ring topology	06	CO1	L1
	c	Define C tokens. List and explain different C tokens	06	CO2	L2
	d	What is an Identifier? Give any 5 rules that are to be followed, while declaring a variable	04	CO2	L2
		OR			
-	a	Explain the categories of hardware devices	04	CO1	L1
	b	List all the operators supported in C. Explain relational, logical and bitwise operators	06	CO2	L2
	c	Write a C program to find the area and perimeter of a rectangle	05	CO2	L2
	d	Convert the following mathematical expressions into C equivalent: i) area=$\sqrt{s(s-a)(s-b)(s-c)}$	05	CO2	L2

		ii) x= -b + $\sqrt{b2-4ac}$/2a			
2	a	Explain formatted input output statements in C with syntax and example.	04	C03	L2
	b	What is two-way selection statement? Explain if, if-else, nested if-else and cascaded if-else with syntax and examples	08	C04	L2
	c	List the types of loops. Explain the working of any one type of loop with syntax and example	05	CO4	L2
	d	Develop a C program to read a year as an input and find whether it is leap year or not	03	CO4	L2
		OR			
	a	Write the guidelines to use printf() function in c language	03	CO3	L2
	b	Explain SWITCH statement, with syntax and example	06	CO4	L2
	c	Write a program to find the reverse of a number and check whether it is a palindrome or not	06	CO4	L2
	d	Distinguish between the following: i) goto and if ii) break and continue	05	CO4	L2
3	a	What is an ARRAY? Explain the different ways of initializing an array with example	04	CO5	L2
	b	Write a C program to read N integers into an array A and to i)find the sum of odd numbers ii) find the sum of even numbers iii) find the average of all numbers Output the results computed with appropriate headings	06	CO5	L3
	c	Write a C program to concatenate two strings without using built in function strcat()	05	CO6	L3
	d	Write a C program to search a name in a list of names using binary searching technique	05	CO6	L3
		OR			
	a	Write the syntax for declaring two-dimensional array and initialize the same with suitable example	04	CO5	L2
	b	Explain any four string manipulation library functions with example.	06	CO6	L2
	c	Write a C Program to sort the given array elements in ascending order by Bubble sort technique	05	CO6	L3
	d	Write a C Program to search a key element in an array using linear search technique	05	CO6	L3
4	a	What is function? Explain the declaration and initialization of single dimensional array with example	04	CO7	L2
	b	What are actual parameters and formal parameters? Illustrate with example	04	CO7	L2
	c	What is Recursion? Write a C program to compute the factorial of a given number 'n' using recursion.	06	C08	L3
	d	Write a C program to compute polynomial coefficient $^{n}C_{r}$ using recursion	06	CO8	L3
		OR			
	a	Explain function call, function definition and function prototype with example to each	06	CO7	L2
	b	Write a C program to check a number is a prime number or not using recursion	06	CO8	L3
	c	Write a C program to find the Fibonacci series using recursion	04	CO8	L3
	d	Explain the two categories of argument passing techniques, with example	04	CO7	L2
5	a	Define structure? Write a C program to store and print name, USN, subject and IA marks of students using structure	06	CO9	L3
	b	Explain structure declaration and initialization with an example	04	CO9	L2
	c	Write a C program to swap two numbers using call by pointers(address)	05	CO10	L3

		method			
	d	Explain any five preprocessor directives in C	05	CO10	L2
		OR			
	a	Write a note on the following with an example for each: I) Arrays of structures ii) arrays within structures iii) structures within structures	06	CO9	L3
	b	What is a pointer? Explain with an examples with declaration and Initialization of a pointer variable	04	CO10	L3
	c	Write a C program to find the sum and mean and standard deviation of all elements in an array using pointers	06	C010	L3
	d	Give the advantages and disadvantages of pointer datatype	04	CO10	L2

2. SEE Important Questions

Course:	C Programming for Problem Solving					Month / Year	Mar /2019
Crs Code:	18CPS23	Sem:	2	Marks:	100	Time:	180 minutes

	Note	Answer all FIVE full questions. All questions carry equal marks.	-	-	
Module	Qno.	Important Question	**Marks**	**CO**	**Year**
1	1	Explain the categories of hardware devices	10	CO1	2010
	2	Explain the components required to process the data in a computer	07	CO1	2010
	3	Mention the various steps associated with information processing cycle and explain them	08	CO1	2011
	4	Mention the different storage devices and explain one o f them	04	CO1	2011
	5	What is the need of network topologies. Explain the following network topologies i) Bus topology ii) star topology iii) ring topology	08	CO1	2010
	6	Write basic structure of C program and explain its different sections	08	Co2	2018
	7	Define C tokens. List and explain different C tokens	10	CO2	2015
	8	Explain the following operators in C language: i) Relational ii) Logical iii) Conditional	08	CO2	2016
	9	Write a C program to find the area and perimeter of a rectangle	06	CO2	2016
	10	Write a note on different types of Type conversions, with an example for each	08	CO2	2017
	11	List all the operators supported in C. Explain relational, logical and bitwise operators	08	CO2	2018
	12	Write a C program to find area of a triangle,when we know the lengths of all three of its sides	08	CO2	2018
	13	What is an Identifier? Give any 5 rules that are to be followed, while declaring a variable	04	CO2	2015
2	1	Explain scanf() and printf() function in C language with syntax and examples	08	CO3	2016
	2	Explain different types of input and output functions in C with syntax and examples	06	CO3	2017
	3	Write the syntax of nested if..else statement and explain its working	08	CO4	2018
	4	What is two-way selection statement? Explain if, if-else,nested if-else and cascaded if-else with syntax and examples	10	CO4	2015
	5	Explain switch statement with an example	06	CO4	2015
	6	List the types of loops. Explain the working of any one type of loop with syntax and example	08	CO4	2016
	7	Write a program to find the reverse of a number and check whether it is a palindrome or not	06	CO4	2016
	8	Distinguish between the following: i) goto and if ii) break and continue	04	CO4	2018
	9	Write a C program to find the roots of quadratic equation	10	CO4	2018
	10	Develop a C program to read a year as an input and find whether it is leap	04	CO4	2017

		year or not			
3	1	Define an array. Write the syntax for declaring two-dimensional array and initialize the same with suitable example	10	CO5	2018
	2	What is an array? How is a single dimensional array is declared and initialized.	06	CO5	2015
	3	Write a C program to read N integers into an array A and to i)find the sum of odd numbers ii) find the sum of even numbers iii) find the average of all numbers Output the results computed with appropriate headings	06	C05	2015
	4	Write a C program to search a name in a list of names using binary searching technique	08	C06	2016
	5	Explain any four string manipulation library functions with example.	08	CO6	2017
	6	What is string? Write a C program that reads a sentence and prints the frequency of each of the vowels and total count of consonants	06	CO5	2016
	7	Write a C program to concatenate two strings without using built in function strcat()	05	CO6	2015
4	1	What is function? Explain the declaration and initialization of single dimensional array with example	05	CO7	2015
	2	Explain the types of function based on parameters	05	CO7	2015
	3	Explain the two categories of argument passing techniques,with example	06	CO7	2015
	4	Explain function call, function definition and function prototype with example to each	06	CO7	2015
	5	What is Recursion? Write a C program to compute the factorial of a given number 'n' using recursion.	08	CO8	2007
	6	Write a C program to check a number is a prime number or not using recursion	06	CO8	2015
	7	Write a C program to compute polynomial co-efficient ${}^{n}c_{r}$ using recursion	04	CO8	2016
	8	Write a C program to compute the factorial of a given number 'n' using recursion	08	CO8	2018
5	1	What is structure? Explain the C syntax of structure declaration with example	04	CO9	2016
	2	Explain structure within structure with an example	08	CO9	2018
	3	Write a C program to pass structure variable as function argument	07	CO9	2015
	4	Write a C program to store and print name, USN, subject and IA marks of student using structure	08	CO9	2015
	5	Write a C program using pointers to compute the sum, Mean and standard deviation of all elements stored in an array of 'n' real numbers	06	CO9	2017
	6	What is pointer? Explain how the pointer is declared and initializes	04	CO10	2016
	7	Explain the array of pointers with example	04	CO10	2016
	8	Write a C program to swap two numbers using call by pointers(address) method	06	CO10	2016
	9	What is file? Explain fopen and fclose functions	05	CO10	2016
	10	Explain any four preprocessor directives in C with example for each	08	CO10	2018