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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

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18CPS13: C programming for problem Solving

A. COURSE INFORMATION

1. Course Overview

Degree:	BE	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

Mod	Module Content	Teaching	Module	Blooms
ule		Hours	Concepts	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 Underst and
	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 Underst and
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 Underst and
	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 Underst and
3	Arrays : Arrays (1-Dimensional, 2-Dimensional),Declaration, Characteristics, Initialization, Character arrays and Strings	4	Structured data representation	L2 Underst and
	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 Underst and
	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

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5.00		
Mod ule	Details	Available
1,2,34	Text Books	
	1. E. Balaguruswamy,Programming in ANSI C, 7 th 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	
	 Sumitabha Das, Computer Fundamentals & C Programming, Mc Graw Hill Education. Gary J Bronson, ANSI C Programming, 4 th Edition, Ceneage Learning. Vikas Gupta: Computer Concepts and C Programming, Dreamtech Press 2013. R S Bichkar, Programming with C, University Press, 2012. V Rajaraman: Computer Programming in C, PHI, 2013. 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	Course Name	Module / Topic / Description	Sem	Remarks	Blooms
	Code					Level
1	18CPS27	C Programming	Familiarize with fundamentals of	2	Required for Module 1	l1
		for problem	basics of computer concepts			
		solving				
	-	-		-		

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.	Concept	Instr	Assessmen	Blooms'
		Hours		Method	t Method	Level
18CPS23.1	Understand the working of Computer	04	Computer	Lecture	Question&	L2
	System		Architecture		Answer	Understand
					Assignment	
18CPS23.2	Understand the procedure to write a C	04	C program	Lecture	Question &	L2
	program and usage of Variables &		structure		Answer	Understand
	Operators				Assignment	
18CPS23.3	Understand to read and write the data	04	Standard	Lecture	Question &	L2
	using Input & Output library functions		Input &		Answer	Understand
			Output		Assignment	
			library			
			Question &			
			Answer			
			Assignment			

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18CPS23.4	Understand to construct a	04	Program	Lecture	Question &	L2
	programming solution to a given		constructs		Answer	Understand
	problem using Branching & Looping				Assignment	
	constructs					
18CPS23.5	Describe the linear representation of	04	Structured	Lecture	Question &	L2
	data using arrays		data		Answer	Understand
			representati		Assignment	
			on			
18CPS23.	Develop Algorithms for data	04	data	Lecture	Question &	L3
6	arrangement & probing using		arrangemen		Answer	Apply
	Searching & Sorting technique		t & probing		Assignment	
18CPS23.7	Understand Modular representation of	04	Modular	Lecture	Question &	L2
	program using User-Defined functions		programmin		Answer	Understand
			g		Assignment	
18CPS23.	Develop a C program using Recursion	04	Recursion	Lecture	Question &	L3
8					Answer	Apply
					Assignment	
18CPS23.	Develop a C program to store the data	04	User-	Lecture	Question &	L3
9	of different types using structures		defined		Answer	Apply
			datatype		Assignment	
18CPS23.1	Develop a C program to store the	04	Memory	Lecture	Question &	L3
0	address of a variable using Pointers		representati		Answer	Apply
			on		Assignment	
-	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	CO1	L2
	programs		
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	COg	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 F		PO2	PO3	PO4	PO5	PO	PO7	PO8	PO9	PO1	PO1	PO1	Level
							6				0	1	2	
18CPS23.1	Understand the working of	2												L2
	computer system													
18CPS23.2	Understand the procedure to	1												L2
	write a C program using													
	operators and expressions													
18CPS23.3	Understand to read and write	1												L2
	the data using Input & Output													
	library functions													
18CPS23.4	Understand to construct a	1	2											L2
	programming solution to a given													
	problem using Branching &													

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	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
18CPS2 <u>3.9</u>	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: Menti	on the mapping strength as 1, 2,	or 3							

4. Mapping Justification

Ma	apping	Justification	Mapping
СО	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	-

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	PO3	No design & development content, No mapping, Attainment will	-				
	DO 1	pe Zero, if mapping done.					
	P04	No investigation & interpretation content. No mapping. Learning is	-				
	DOF	at the basic level. Attainment will be zero, il mapping done.					
	P05	No toot content. No mapping	-				
	P06	No social, cultural issues. No mapping	-				
	P07	No Impact on Environment and sustainability. No mapping	-				
	P08	No team work or lead for the ethical work. No mapping	-				
	P09	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					
	PO3	No design &development content, No mapping, Attainment will	-				
		be Zero, if mapping done.					
	PO4	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					
	P06	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	_				
	P06	No social cultural issues No mapping	-				
	P07	No impact on Environment and sustainability. No mapping	_				
	PO8	No team work or lead for the ethical work. No mapping	_				
	POg	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					
C06	PO1	Linderstanding the Concepts of arrays	1				
	PO2	analyse the problem by using the knowledge of arrays	2				
	PO2	design and develop the algorithms for sorting and searching	3				
	103	techniques	5				
	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	-				
	PO0	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.	_				
	P()12	No mapping as there is only understanding	_				
C07	PO1	Understanding the modular representation of a program	1				
			· ·				

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Copyright ©2017. cA	AS. All rights reserved	analyze the problem requires the knowledge of elements of	2				
	P02	functions	2				
	PO2	Design, and develop the program requires the knowledge of	2				
	103	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	-				
	P06	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	2				
		functions					
	PO3	Design and develop the program requires the knowledge of	3				
		recursion					
	P04	No Investigation & Interpretation content. No mapping. Learning is	-				
	DOr	No tool content. No mapping					
	PO5	No cocial cultural issues. No mapping	-				
	PO0	No impact on Environment and sustainability. No mapping	-				
	PO7	No impact of Environment and sustainability. No mapping	-				
	PO0	No team work of 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	_				
COo	PO1	Understanding the Concept of Structures	1				
009	PO2	analyze the problem requires the knowledge of elements of					
		Structures	_				
	PO3	Design and develop the program requires the knowledge of	3				
		Structures					
	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				
	P02	analyze the problem requires the knowledge of Pointers	2				
	PO3	Pointers	3				
	PO 4	No investigation & interpretation content. No mapping Learning is	_				
		at the basic level. Attainment will be Zero, if mapping, Learning					
	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.	-				
			÷				

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	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

Mod	Title	Teaching	No. of question in Exam						CO	Levels
ule		Hours	CIA-1	CIA-2	CIA-3	Asg	Extra	SEE		
#							Asg			
1	Introduction to computer Hardware	08	2	-	-	1	-	2	CO1,	L2, L2
	and Software,Overview of C								CO2	
2	Managing Input and output	08	2	-	-	1	-	2	CO3,	L2
	operations,Conditional Branching								CO4	
	and loops									
3	Arrays, Basic algorithms	08	-	2	-	1	-	2	CO5,	L2, L3
									CO6	
4	User-defined functions and	08	-	2		1	-	2	CO7,	L2, L3
	Recursion								C08	
5	Structures and Pointers,	08	-	-	4	1	-	2	CO9,	L3
	Preprocessor Directives								CO10	
_	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.

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2. Continuous Internal Assessment (CIA)

Evolution	Walabtaga in Marka	<u> </u>	Lovolo
Evaluation	weighlage in Marks	CO	Levels
CIA Exam – 1	30	CO1, CO2, CO3, CO4	L2, L2, L2, L2
CIA Exam – 2	30	CO5, CO6, CO7, Co8	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, CO8	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	08 Hrs
		Time:	
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	СО	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
С	Application Areas	СО	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

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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	CO2	L2
	language? explain		
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	CO2	L2
	language, giving an example to each.		
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:	CO2	L2
	i) area= $\sqrt{s(s-a)(s-b)(s-c)}$		
	ii) x= -b + $\sqrt{b2-4ac}/2a$		
е	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
h	Course Schedule		
	Module Content Covered	-	
12	Managing Input and output operations Introduction		
12	Reading a character writing a character	<u> </u>	
-13	Formattad input and Formattad output comple program	<u> </u>	
14	Formatted input and Formatted output, sample program	<u> </u>	
15	Portialled input and Portialled output, sample program		
10	statements,SWITCH statements,Break statements,Continue statements and GOTO statements	004	LZ
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
С	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

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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	CO4	L2
	or not		
20	Explain the syntax of WHILE statement. Write a C program to check the	CO4	L2
	given number is palindrome or not		
21	Distinguish between the following:	CO4	L2
	i) goto and if ii) break and continue		
22	List all the branching statements and Looping statements	CO4	L2
23	List all unconditional statements and explain with syntax	CO4	L2
е	Experiences		
1			
2			
3			
4			
5			

E1. CIA EXAM – 1

a. Model Question Paper - 1

Crs Code		18CPS23	Sem:	2	Marks:	30	Time: 90) minute	s	
Cou	rse:	C program	iming for pr	oblem so	lving					
-	-	Note: Ansv	wer any ON	E FULL q	uestion from	each Modul	.е,	Marks	со	Level
		each carry	/ equal mar	ks.						
	MODULE-1									
1	a	What is Cc	mputer? Ex	plain its p	oarts.			03	CO1	L1
	b	Explain primary and secondary memory devices in detail.							CO1	L2
	С	List all operators supported in C. Explain relational, logical and bitwise operator with example.							CO2	L2
	d	Write a C of all three	program to sides.	find the a	area of triangl	e, when we	know the length	03	CO2	L2
					OR					
2	а	Explain inp	out and outp	out device	es with examp	le		04	CO1	L2
	b	Explain different network topologies with relevant diagram					05	CO1	L2	
	С	What is a variable? Explain the rules for constructing variables in c					04	CO2	L2	
		language								
	d	Convert t	he following	g mathem	natical expres	sions into C e	expressions:	02	CO2	L2
		b x y = b(ad+e) c								
		"b+c b·	- <i>C</i>	b-a c	1					
					MODULE-2					
3	а	Explain wit	th syntax an	d exampl	.e: i) Input()	ii) Output	()	04	CO3	L2
	b	Explain the	e two way s	election(if	,if-else, neste	ed if-else, cas	scaded if-else) ir	04	CO4	L2
		Clanguage	e with synta	X		<u>()))))))))))))))))))</u>			00.	
	C	write a pro	ogram to fin	d area an	a perimeter o	t a circle		03	004	L2
	d Using Switch statement implement simple calculator program						04	CO4	L2	
					OR		<u> </u>			
4	a	Write the g	guidelines to	ouse sca	inf() & printf() f	unctions in (language	03	CO3	L2
	b	Write a C p	program to	find the re	oots of Quadr	atic equation	ו	04	<u>CO4</u>	L2
	C	What is a l	oop? Explai	n the diffe	erent loops in	C language		04	CO4	L2
	d	Write a C p	program to o	compute	binomial coef	ficients		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

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Cours	se: C progra	Imming for problem solving							
Note:	Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.								
SNo	USN	Assignment Description	Mark	со	Level				
			S						
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 $1+x+x^2 + x^3 + \dots + x^n$		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	08Hrs
		Time:	
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 &	CO6	L3
	Sorting technique		
b	Course Schedule		
Class No	Module Content Covered	CO	Level
21	Arrays(1-Dimensional,2	CO5	L2
	Dimensional),Declaration,Characteristics,Initialization		
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

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20	String arrays	Carting Algorithms, Lincor coord	CO5	L2
2/	Searching and	Sorung Algoniums -Linear search	C06	L3
20	Binary search		000	L3
29	Bubble Sort		C06	L3
30	Selection sort		006	L3
<u> </u>	Application Ar	0.25	00	
	Computer Gran	eas phics Databaso Managomont system		
2	Banking soctor		CO5	
2	Dariking Sector	5	000	3
d	Poviow Questi	ons		
1	What is an AR	RAV? Explain the different ways of initializing an array with	C:05	12
-	example	with Explain the amerone ways of miliadeling an analy with	005	
2	Write a C pro	gram to find sum of array elements by passing array as	CO5	L3
	function argum	nent		
3	Explain the diff	erent ways of declaring an array with example	CO5	L2
4	Explain any fou	Ir string manipulation library function with example	CO5	L2
5	What is string?	? Write a C program that reads a sentence and prints the	CO5	L3
	frequency of e	ach of the vowels and total count of consonants		
6	Write a C pro	gram to search a name in a list of names using Binary	CO6	L3
7	Write a C prog	ram to sort the given array elements in ascending order by	C06	10
	selection sort	ram to soft the given analy elements in ascending order by	000	L3
8	Write a C pro	gram to concatenate two strings without using built-in	CO5	L3
	function streat			
9	Explain with pr	ogram: 1) String Reverse II) String Copy III) String Compare	CO5	L2
10	Write a C prog	ram to implement string copy operation STRCOPY(str1,str2)	CO5	L3
0	Experiences			
	Lypenences		-	-
2				
3				
5				

Module - 4

Title:	User Defined Functions and Recursion	Appr	08 Hrs
		Time:	
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
С	Application Areas	CO	Level

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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	C07	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	C07	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
е	Experiences	-	-
1		C07	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	minute	s	
Course:		C program	iming for pr	oblem solvin	Ig					
-	-	Note: Ansv	wer any ON	E FULL ques	stion from e	ach Module	,	Marks	со	Level
		each carry	/ equal mai	ks.						
				MO	DULE-3					
1	а	What is declaratior	an array? 1 of one din	Explain diff nensional arr	erent meth ay	nods of init	tialization and	03	CO5	L2
	b	Write a (dimension	C program al arrays	to implem	ent Matrix	multiplication	on using two	04	CO5	L3
	С	Write a C function	C program	to concater	nate 2 strin	gs without	using Built-in	05	CO5	L3
	d	List differe	nt types of	searching te	chniques an	d explain an	y one	03	CO6	L2
					OR					
2	а	What is declaration	an array? 1 of two din	Explain diff nensional arr	ⁱ erent meth ay	nods of init	tialization and	04	CO5	L2
	b	Write a C using bubl	program to ole sort	sort the give	en array elei	ments in des	cending order	05	CO5	L3
	С	Explain all	String man	ipulation libra	ary function:	s with examp	oles	04	CO5	L2
	d	List differe	nt types of	sorting techr	niques and e	xplain any o	ne	02	CO6	L2
				MO	DULE-4					
3	а	What is a techniques	a function? s with exam	? Explain tv ples	vo categor	es of argu	ment passing	04	CO7	L2
	b	Explain the	e following call ii) functi	with an exam on definition	nple: iii) function	orototype		03	C07	L2
	С	Write a C p	orogram to	find the sum	of array ele	ements by pa	assing array as	04	C07	L3

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		function argument						
	d	Write a C program to find factorial of a positive integer	04	CO8	L3			
		OR						
4	а	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			
	С	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 C	ode:	18CPS23	3 Sem:	2	Marks:	5 / 10	Time:	90 - 120	0 – 120 minutes	
Cours	se:	C Progra	amming for F	Problem Sol	lving					
Note:	Each	student	to answer 2-	3 assignme	ents. Each as	signment ca	arries equal m	lark.		
SNo		USN		Assi	gnment Des	scription		Marks	СО	Level
1			What is an a	array? Expl	ain the dec	laration and	initialization	of	CO5	L2
			one dimensi	onal arrays	s with exam	ole				
2			Explain the arrays with e	declaratior example	n and initial	ization of tv	vo dimension	al	CO5	L2
3	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						en ts	CO5	L3	
4			How string is manipulatior	s declared n functions	and Initialize with examp	ed? Explain les	any Four strir	ng	CO5	L2
5			Write a C Program to sort the given array elements ir ascending order by Bubble sort technique					in	CO6	L3
6	6 Write a C linear sea			ogram to s technique	search a key e	/ element in	an array usir	ng	CO6	L3
7			What is func techniques \	tion? Expla with examp	ain two cate les	gories of arg	jument passir	ng	C07	L2
8			Write a C pro	ogram to fir	nd cube of a	number usi	ng function		CO7	L3
9			Explain the e	elements of	f User define	ed function			CO7	L2
10			Explain fur prototype w	nction call ith example	l, function e to each	definition	and function	on	CO7	L2
11			What are ac with exampl	tual param e	eters and fo	ormal param	eters? Illustra	te	C07	L2
12			What is recu of a given nu	ırsion? Writ umber 'n' us	e a C progra sing recursio	am to compi on	ute the factor	ial	CO8	L3
13			Write a C pro	ogram to co	ompute poly	ynomial coe	fficient ⁿ C _r usiı	ng	CO8	L3

D3. TEACHING PLAN - 3

Module – 5

Title:	Structure and Pointers, Preprocessor Directives	Appr	08 Hrs
		Time:	
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	COg	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	CO	Level	

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38	Structure Defini	009	L3			
39	Initialization,stru	acture within structure	COg	L3		
40	array of structu	res,pointer to structures	COg	L3		
41	Pointer Definitio	n, declaration of pointers	CO10	L3		
42	Initialization of p	pointers,Accessing a variable	CO10	L3		
43	Array of pointer	s,pointers and structures	CO10	L3		
44	void pointers,sa	Imple programs	CO10	L3		
45	Preprocessor D	irectives- macro substitution,inclusion	CO10	L3		
С	Application Are	eas	CO	Level		
1	Computer Arch	itecture	CO9	L3		
2	System prograr	nming	CO10	L3		
d	Review Questic	ons	-	-		
1	What is structur	re? Explain its declaration and initialization with an example	COg	L3		
2	Write a C progra	am to pass structure variable as function arguments	CO9	L3		
3	Write a note on	the following with an example for each:	CO9	L3		
	structures					
4	Show how a str an example	ucture variable is passed as a parameter to a function,with	CO9	L3		
5	How structure i	is different from an array? Explain declaration of structure	CO9	L3		
	with an example	e				
6	Define point v Initialization of v	ariable. Explain with an example, the declaration and /ariable	CO10	L3		
7	Write the differe	ence between array and structure	CO9	L3		
8	Give the advant	ages and disadvantages of pointer datatype	CO10	L3		
9	Write and Expla	ain any five preprocessor directives in C	CO10	L3		
10	Explain malloc()),calloc() functions with examples	CO10	L3		
	F					
e	Experiences		-	-		
1						
2						
3						
<u> </u>						
1 D	1			1		

E3. CIA EXAM – 3

a. Model Question Paper - 3

Crs (Code:	18CPS23	Sem:	2	Marks:	30	Time: 90	o minute	es	
Cou	rse:	C Program	ming for	Problem S	olving					
-	-	Note: Ans	wer any	ONE FULL	question from	each M	odule,	Marks	СО	Level
		each carry	y equal n	narks.						
					MODULE-5					
1	а	Define stru	ucture? V	Vrite a C pro	ogram to store	and prir	nt name,USN,subjec	t 05	CO9	L3
		and IA ma	rks of stu	idents using	g structure					
	b	Explain arr	ay of po	nters with e	example			05	CO10	L3
	С	Explain #c	lefine and	d #include	preprocessor	directive	S	05	CO10	L3
					OR					
2	а	Explain th	e C synt	ax of struc	cture declarat	ion and	initialization with a	n 05	CO9	L3
	b	Explain hc with exam	w the st ple	ructure var	iable passed a	as a para	ameter to a functior	n 06	CO9	L3
	С	Explain wi i) fputs() ii	th syntax i) fgets()	:: iii) fgetc() i	v) fputc()			04	CO10	L3

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				,	
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		MODULE-5			
3	а	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	а	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
	С	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 C	ode:	18CPS23	Sem:	2	Marks:	5 / 10	Time:	90 - 120	minutes	S
Cours	se:	C Progra	mming for Pr	oblem Solv	/ing					
Note:	Each	student t	o answer 2-3	assignmer	nts. Each assi	gnment ca	arries equal m	ark.		
SNo		USN		Assig	nment Desc	ription		Marks	CO	Level
1		r	What is Struc	tured datat	ype? Explair	l			CO9	L3
2			Explain the c program	oncept of	array of stru	ictures, wi	th a suitable	С	CO9	L3
3			Write a C pro using an arra and print the Rs.10,000	gram to ma y of struct e details of	aintain a reco ures with th employees	ord of 'n' e ree fields s whose sa	employee deta (id,name,salar alary is abov	ail y) 'e	CO9	L3
4			Explain struct	ure within s	structure wit	h an exam	ple		CO9	L3
5			What is a po mean of all e	binter? Writ lements in a	e a C progi an array usin	ram to fine g pointers	d the sum ar	d	CO10	L3
6			Write a C pro method	gram to sw	/ap two num	bers using	I call by pointe	er	CO10	L3
7			Explain how p	pointers and	d arrays are i	related wit	h example		CO10	L3
8			What is a file?	PExplain fo	pen and fclo	se functio	าร		CO10	L3
9			Explain fgets	and fputs f	unctions				CO10	L3
10			Write a C pr using built in	ogram to offunction	copy one fil	e to anotl	ner file witho	ut	CO10	L3

F. EXAM PREPARATION

1. University Model Question Paper

Course:		C Programming for Problem Solving Mon	nth / Y	Year	Mar /2	2019
Crs	Code:	18CPS23 Sem: 2 Marks: 100 Time	e:		180 mi	nutes
-	Note	Answer all FIVE full questions. All questions carry equal marks.	Μ	1arks	СО	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 netw	/ork	06	CO1	L1
		topologies i) Bus topology ii) star topology iii) ring topology				
	С	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				CO2	L2
		declaring a variable				
		OR				
-	а	Explain the categories of hardware devices		04	CO1	L1
	b	List all the operators supported in C. Explain relational, logical and bitw	vise	06	CO2	L2
		operators				
	С	Write a C program to find the area and perimeter of a rectangle				L2
	d	Convert the following mathematical expressions into C equivalent:		05	CO2	L2
		i) area= $\sqrt{s(s-a)(s-b)(s-c)}$				

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		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
	С	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			
	а	Write the guidelines to use printf() function in c language	03	CO3	L2
	b	Explain SWITCH statement, with syntax and example	06	CO4	L2
	С	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	а	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
	С	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
	а	Write the syntax for declaring two-dimensional array and initialize the		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	а	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
	С	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 "Crusing recursion	06	CO8	L3
	а	OR 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
	С	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	C07	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
	С	Write a C program to swap two numbers using call by pointers(address)	05	CO10	L3

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

2. SEE Important Questions

Crs Code: 18CPS23 Sem: 2 Marks: 100 Time: 180 minute Note Answer all FIVE full questions. All questions carry equal marks. - <	Course:		C Programming for Problem Solving Month .	/ Year	Mar /2	2019
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		10	Develop a C program to read a year as an input and find whether it is leap	04	CO4	2017

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		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 "cr 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	80	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