

PROBLEM SOLVING THROUGH PROGRAMMING

Course Code	21PSP14	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	2:2:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03



Course Objectives:

1. Elucidate the basic architecture and functionalities of a Computer
2. Apply programming constructs of C language to solve the real world problems
3. Explore user-defined data structures like arrays, structures and pointers in implementing solutions to problems
4. Design and Develop Solutions to problems using modular programming constructs such as functions and procedures

Pedagogy (General Instructions)

These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes.

1. Lecturer method (L) need not to be only traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes.
2. Use of Video/Animation to explain functioning of various concepts.
3. Encourage collaborative (Group Learning) Learning in the class.
4. Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analyse information rather than simply recall it.
6. Introduce Topics in manifold representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.

Module-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.

Overview of C: Basic structure of C program, executing a C program. Constant, variable and data types, Operators and expressions

Pedagogy: Chalk&board, Active Learning

Module-2

Managing Input and output operations. Conditional Branching and Loops. Example programs, finding roots of a quadratic equation, computation of binomial coefficients, plotting of Pascal's triangle.

Pedagogy: Chalk & board, Active Learning, Problem based learning

Module-3

Arrays: Arrays (1-D, 2-D), Character arrays and Strings, Basic Algorithms: Searching and Sorting Algorithms (Linear search, Binary search, Bubble sort and Selection sort).

Pedagogy: Chalk & board, MOOC, Active Learning

Module-4

User Defined Functions and Recursion.

Example programs: Finding Factorial of a positive integer, GCD of two numbers and Fibonacci sequence.

Pedagogy: Chalk& board, Problem based learning

Module-5

Structures, Unions and Pointers, Pre-processor Directives and Example Programs

Pedagogy: Chalk & board, MOOC

Course Outcomes (Course Skill Set)

At the end of the course the student will be able to:

1. Recognize the hardware parts and software types in a computer.
2. Elucidate the basic architecture and functionalities of a Computer
3. Apply programming constructs of C language to solve the real world problem
4. Explore user-defined data structures like arrays, structures and pointers in implementing solutions to problems like searching and sorting
5. Design and Develop Solutions to problems using modular programming constructs using functions.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain minimum of 40% marks individually both in CIE and SEE to pass. Theory Semester End Exam (SEE) is conducted for 100 marks (3 Hours duration). Based on this grading will be awarded.

Continuous Internal Evaluation:

1. Methods recommended: Three Test (60%), Written Quiz (20%) and module assignments (20%).
2. The class teacher has to decide the topic for closed book test and Written Quiz. In the beginning only teacher has to announce the methods of CIE for the subject.

Semester End Examination:

Theory SEE will be conducted by University as per scheduled time table, with common question papers for subject

1. The question paper will have ten questions. Each question is set for 20 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub questions), should have a mix of topics under that module.
3. The students have to answer 5 full questions, selecting one full question from each module

Suggested Learning Resources:

Books

1. E. Balaguruswamy, Programming in ANSI C, 7th Edition, Tata McGraw-Hill
2. Brian W. Kernighan and Dennis M. Ritchie, The 'C' Programming Language, Prentice Hall of India.

Reference:

1. Reema Thereja, Programming in C, Cengage publication,

Web links and Video Lectures (e-Resources):

1. elearning.vtu.ac.in/econtent/courses/video/BS/15PCD23.html
2. <https://nptel.ac.in/courses/106/105/106105171/>

MOOC courses can be adopted for more clarity in understanding the topics and verities of problem solving methods.

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

1. Real world problem solving using group discussion. E.g., Electricity bill generation. etc.,
2. Demonstration of solution to a problem through programming.



Estd: 1986

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SJC INSTITUTE OF TECHNOLOGY

Chickballapur – 562 101

Department of Computer Science & Engineering LESSON PLAN

SUBJECT TITLE	PROBLEM SOLVING THROUGH PROGRAMMING		
SUBJECT TYPE	CORE		
SUBJECT CODE	21PSP13/23		
ACADEMIC YEAR	2021 (ODD SEMESTER)	BATCH	2021-2025
SCHEME	CBCS scheme (Effective from the academic year 2021 -2022)		
SEMESTER & SECTION	I - A		
IA MARKS	50	EXAM MARKS	50
NUMBER OF LECTURE HOURS/WEEK	3	TOTAL NUMBER OF LECTURE HOURS	40
FACULTY NAME	GAVINA C G	NO. OF TIMES HANDLED	04

COURSE LEARNING OBJECTIVES: This course will enable students to

- Elucidate the basic architecture and functionalities of a Computer
- Apply programming constructs of C language to solve the real-world problems
- Explore user-defined data structures like arrays, structures and pointers in implementing solutions to problems
- Design and Develop Solutions to problems using modular programming constructs

Course Outcomes: At the end of this course, students are able to:

CO1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts.
CO2	Apply programming constructs of C language to solve the real world problem
CO3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting
CO4	Explore user-defined data structures like structures, unions and pointers in implementing solutions
CO5	Design and Develop Solutions to problems using modular programming constructs using functions.

DELIVERY PLAN WITH DETAILS

MODULE - 1

Lecture #	Topic	Mode of Delivery (Pls Tick ✓)				Date of Delivery	COs Covered
		1	2	3	4		
1.	Introduction to Computer Hardware and Software: Computer generations,	✓				20/12/21	CO1
2.	Computer types, bits, bytes and words	✓				22/12/21	CO1
3.	CPU, Primary memory, Secondary memory, ports and connections,	✓				24/12/21 27/12/21	CO1
4.	Input devices, output devices,	✓				28, 29/12/21	CO1
5.	Computers in a network, Network hardware,	✓				30/12/21	CO1
6.	Software basics, software types.	✓				30/12/21	CO1
7.	Basic structure of C program; executing a C program.	✓				5/1/22	CO2
8.	Constant, variable and data types, Operators and expressions.	✓				6/1/22 7/1/22, 12/1/22	CO2

Textbook :

1. E. Balaguruswamy, Programming in ANSIC, 7th Edition, Tata McGraw-Hill
2. Brian W. Kernighan and Dennis M. Ritchie, The 'C' Programming Language, Prentice Hall of India.

Signature s	Faculty: <i>Deena</i>	#HOURS	Allotted	Taken
	HoD: <i>M. J. ...</i>		8	12
Remarks	<i>Executed.</i>			

MODULE - 2

Lecture #	Topic	Mode of Delivery (Pls Tick ✓)				Date of Delivery	COs Covered
		1	2	3	4		
1.	Managing Input and output operations.	✓				12/1/22 13/1/22	CO2
2.	Conditional Branching	✓				17, 19/1/22	CO2
3.	Programming examples on Conditional Branching	✓				19/1/22	CO2
4.	Loops: while, do-while Example programs	✓				29/1/22	CO2
5.	For loop: example programs	✓				20/1/22	CO2
6.	Finding roots of a quadratic equation	✓				20/1/22	CO2
7.	Computation of binomial coefficient	✓				21/1/22	CO2
8.	Plotting of Pascal's triangle.	✓				21/1/22	CO2

Textbook :

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Signature s	Faculty: <i>Deena</i>	#HOURS	Allotted	Taken
	HoD: <i>M. J. ...</i>		08	10

Remarks	Executed.									
MODULE - 3										
Lecture #	Topic	Mode of Delivery (Pls Tick ✓)				Date of Delivery	COs Covered			
		1	2	3	4					
1.	Arrays(1-D): Example programs	✓				8/1/22	CO3			
2.	Arrays(2-D): Example programs	✓				3/2/22	CO3			
3.	Character arrays and Strings,	✓				9/10/22	CO3			
4.	Basic Algorithms: Searching and Sorting Algorithms	✓				11/2/22	CO3			
5.	Binary search,	✓				18/2/22	CO3			
6.	Linear search,	✓				18/2/22	CO3			
7.	Bubble sort	✓				16/2/22	CO3			
8.	Selection sort	✓				16/2/22	CO3			

Textbook :

1. E.Balaguruswamy, Programming in ANSIC, 7th Edition, Tata McGraw-Hill
2. Brian W. Kernighan and Dennis M. Ritchie, The 'C' Programming Language, Prentice Hall of India

Signature s	Faculty: <i>[Signature]</i>	#HOURS	Allotted	Taken
	HoD: <i>[Signature]</i>		08	10

Remarks: Executed as per the plan

MODULE - 4

Lecture #	Topic	Mode of Delivery (Pls Tick ✓)				Date of Delivery	COs Covered
		1	2	3	4		
1.	User Defined Functions and Example	✓				21/2/22	CO5
2.	Library functions	✓				21/2/22	CO5
3.	Functions programs	✓				21/2/22	CO5
4.	Recursion: programs	✓				18/3/22	CO5
5.	Programming examples	✓				16/3/22	CO5
6.	Finding Factorial of a positive integer,	✓				14/3/22	CO5
7.	GCD of two numbers and	✓				14/3/22	CO5
8.	Fibonacci sequence	✓				14/3/22	CO5

Textbook:

1. E.Balaguruswamy, Programming in ANSIC, 7th Edition, Tata McGraw-Hill
2. Brian W. Kernighan and Dennis M. Ritchie, The 'C' Programming Language, Prentice Hall of India

Signature s	Faculty: <i>[Signature]</i>	#HOURS	Allotted	Taken
	HoD: <i>[Signature]</i>		08	07

Remarks:

MODULE - 5

Lecture #	Topic	Mode of Delivery (Pls Tick ✓)				Date of Delivery	COs Covered
		1	2	3	4		

1.	Structure concept and programming examples	✓			17/3/22	CO4
2.	Structure within structures	✓			17/3/22	CO4
3.	Unions	✓			20/3/22	CO4
4.	Pointers and its concepts	✓			24/3/22	CO4
5.	Pointers with programming examples	✓			24/3/22	CO4
6.	Pre-processor Directives	✓			28/3/22	CO4
7.	Addition of two complex numbers using structures,	✓			28/3/22	CO4
8.	Compute the sum, mean and standard deviation of all elements stored in an array of N real numbers using pointers.	✓			30/3/22	CO4

Textbook :

1. E. Balaguruswamy, Programming in ANSIC, 7th Edition, Tata McGraw-Hill
2. Brian W. Kernighan and Dennis M. Ritchie, The 'C' Programming Language, Prentice Hall of India

Signature s	Faculty:	#HOURS	Allotted	Taken
	HoD:		08	07
Remarks	Executed as per the plan.			

Text Books:

1. E. Balaguruswamy, Programming in ANSIC, 7th Edition, Tata McGraw-Hill
2. Brian W. Kernighan and Dennis M. Ritchie, The 'C' Programming Language, Prentice Hall of India

Reference Books:

1. Reema Thereja, Programming in C, Cengage publication,

(Note: Mode of Delivery : 1: Black Board 2: PPT 3: Video 4: Demo/Hands-on)

INTERNAL/ASSIGNMENT/QUIZ SCHEDULE:

TEST and QUIZ		COs and Portions Covered		ASSIGNMENT	
Test# and Quiz#	DATE	CO	Modules	Assignment#	DATE
T1 & Q1	21/1/22		Module-1, Module-2(half)	A1	23/1/22
T2 & Q2	4/3/22		Module-2(remaining) Module-3	A2	28/2/22
T3 & Q3	9/4/22		Module-4, 5	A3	

SUMMARY:

Signatures With Date	Faculty: <i>[Signature]</i>	Total #HOURS	Allotted	Taken
	HoD: <i>[Signature]</i>		40	62
Remarks				

ENCLOSURES

1. Syllabus
2. CO Attainment
3. Gap Analysis
4. Special lectures/talks arranged if any

Feedback by PAC

For ME & CV sections all cos attained level 3 for SDT. target to each co. suggested to show the improvement.

[Signature]
Faculty

[Signature]
Course coordinator

[Signature]
PAC HOD

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Estd: 1986

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Department of Computer Science & Engineering

QUESTION BANK

SUBJECT TITLE	PROBLEM SOLVING THROUGH PROGRAMMING		
SUBJECT TYPE	CORE		
SUBJECT CODE	21PSP13		
ACADEMIC YEAR	2021 (ODD SEMESTER)	BATCH	2021-2026
SCHEME	2021 SCHEME		
SEMESTER	I/ II		
FACULTY NAME and DESIGNATION	GAVINA C G, ASST. PROFESSOR		

Module -1

Q. No.	Questions	Bloom's LL	COs
1	What is Computer . Describe the various types of computers	L1	CO1
2	List and explain any 4 input and output devices .	L1,L2	CO1
3	Define software ? Explain different types of software.	L1,L2	CO1
4	With a neat diagram explain the basic structure/block diagram of a computer.	L3	CO1
5	Explain the generations of computer in detail.	L2	CO1
6	Explain the basic structure of a C program with an example.	L2	CO1
7	What is Token ? What are the different types of token available in C language	L3	CO1
8	What is an identifier (variable)? What are the rules to construct identifier (variable)? Classify the following as valid/invalid Identifiers. i) num2 ii) \$num1 iii) +add iv) a_2 v) 199_space vi) _apple vii)#12	L3	CO1
9	Define i)variable ii) Constant iii) Associativity iv)Precedence v) Algorithm vi) flowchart	L2	CO1
10	Explain with example, the various constants available in C language	L3	CO1
11	List and Explain any five operators used in C language with an example for each.	L3	CO1
12	What are basic data types available in C? Write the significance of each data type.	L3	CO1

13.	Write a C program i. find the area and perimeter of a circle ii. find the area and perimeter of a rectangle iii. Compute the simple interest iv. To find the area of triangle when we know the lengths of all three of its sides v. find the largest of three numbers using ternary operator vi. To find the sum and average of given three numbers	L4	CO3
14.	What is an expression? 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 $c=8$	L5	CO2
15.	Convert the following mathematical expression into C equivalent i) $\text{area} = s(s-a)(s-b)(s-c)$ ii) $x = -b + b^2 - 4ac$	L4	CO2
16.	What is type conversion ? Explain two types of conversion with examples	L3	CO2

Module -2

<i>Q. No.</i>	<i>Questions</i>	<i>Bloom's LL</i>	<i>COs</i>
1	Explain formatted input and output functions . Explain with examples	L2	CO3
2	List all conditional control statements used in C. Explain any two with syntax and example (or) What is two way selection statements? Explain if, if else, and else-if ladder with examples.	L2	CO3
3	What are unconditional control statements? Explain any two with syntax and example	L3	CO3
4	Write a C program that reads from the user an arithmetic operator and two operands, perform the corresponding arithmetic operation on the operands using switch statement	L3	CO3
5	Write a C program i. To find the reverse of an integer number and check whether it is palindrome or not. ii. To find the biggest of three numbers iii. To find GCD and LCM of two numbers. iv. To find the eligibility for voting and draw the flowchart.	L3	CO3
6	List the differences between while loop and do-while loop. write a C program to find sum of Natural numbers from 1 to N using for loop	L3	CO3
7	Write a C program to find the factorial of a number using do-while , where the number n is entered by user.	L3	CO3
8	Write a C program i. To plot pascal's triangle. ii. To compute binomial co-efficient.	L4	CO3
9	Show how break and continue statements are used in a C program, with example	L4	CO3
10	Write a C program that takes three coefficients (a,b,and c) of a quadratic equation ; (ax^2+bx+c) as input and compute all possible roots and print them with appropriate messages.	L5	CO3

<i>Module -3</i>			
<i>Q. No.</i>	<i>Questions</i>	<i>Bloom's LL</i>	<i>COs</i>
1	What is array ? Explain the declaration and initialization of one dimensional and two dimensional array with an example	L2,L3	CO3
2	Write a C program to search an element using linear and binary techniques (or) Write an algorithm and develop a C program to search an integer from N numbers in ascending order using binary searching technique.	L3	CO3
3	Write a C program for (i) Bubble sort (ii) selection sort (or) Write an algorithm and develop a C program that reads N integer numbers and arrange them in ascending order using selection Sort	L3	CO3
4	Write a C program i. to find the transpose of a given matrix ii. that accepts (3×3 ordered matrices A and B),and compute the following (i)summation of Two numbers (ii) Subtraction of Two numbers iii. Write a C program to find the largest element in an array	L3	CO3
5	Define string . How string is declared and initialized? Explain string input/output functions with an example	L2	CO3
6	Write a C program that reads a sentence and prints the frequency of each of the vowels and total count of consonants?	L3	CO3
7	List out all string manipulation function. Explain any two with example	L2	CO3
8	a. Write a C Program to implement string copy operation STRCOPY(str1,str2) that copies string str1 to another string str2 without using library function b. Write a C program to concatenate two strings without using built-in function strcat().	L5	CO3
9	Explain with example (i) Character string (ii) String literal (iii) storage classes	L2	CO3
10	Write a C program to check whether the given string is palindrome or not without using in built function	L5	CO3

<i>Module -4</i>			
<i>Q. No.</i>	<i>Questions</i>	<i>Bloom's LL</i>	<i>COs</i>
1	What is function ? Explain the difference between user defined and library functions. List various advantages of a function.	L4	CO5
2	Demonstrate the use of C user defined functions with a suitable example.		CO5
3	Explain the different elements of user defined functions in detail	L3	CO5
4	Explain two categories/types of argument passing techniques, with examples. and Differentiate between call by value and call by reference with example.	L2, L4	CO5

5	Explain how actual parameters are different from formal parameters.		CO5
6	Write a c-program using function i. to check whether the given number is prime or not. ii. to swap two numbers iii. to find the factorial of a number iv. find GCD and LCM of two numbers	L3	CO5
7	Give the scope and life time of the following (i) External variable (ii) Static variable (iii) Automatic variable (iv) Register variable	L2	CO5
8	What is Recursion ? Write a C program (using recursion) i. to compute polynomial co-efficient nCr using recursion ii. calculate the Fibonacci sequence iii. for Binary to Decimal conversion.	L3	CO5
9	Write a C function that can be called to find the largest element of an integer array of size n.	L1,L4	CO5
10	List any five built-in functions and explain any two of them.	L1,L2	CO5

Module -5

Q. No.	Questions	Bloom's LL	COs
1	What is structure ? Explain the C syntax of structure declaration with example	L1,L2	CO4
2	Explain array of structure and structure within a structure with an example	L3	CO4
3	Write a C program to maintain a record of „n“ students details using an array of structures with four fields(roll no,name,marks,and grade).Assume appropriate data type for each field. Print the marks of the student given the student name as input.	L1,L2	CO4
4	Write a C program to pass structure variable as function argument	L1,L2	CO4
5	Write a C program to store and print name, USN, subject and IA marks of students using structure	L2	CO4
6	How does a structure differ from an array and union? Give example.	L2	CO4
7	Explain with example how to create a structure using „typedef“	L3	CO4
8	What is pointer ? Explain how the pointer variable declared and initialized?	L3	CO4
9	Explain the array of pointers with example? or Explain how pointers and arrays are related with example	L4	CO4
10	Write a C program to find the sum and mean of all elements in an array using pointer	L4	CO4
11	What is pointer? give the advantages and disadvantages of pointer data type	L2	CO4
12	What is preprocessor directive ? Explain #define and #include preprocessor directives or Explain any five preprocessor directives in C	L2	CO4

Note:

1. Questions shall be framed by consolidating comprehensively from the following sources
 - Exercise problems of text books/ references
 - Previous year question VTU exam Question paper. (Mark the year/exam beside the question)
 - Questions by Experts during Interview/Academic Audit
 - Internet sources/ other Universities examination question papers.
 - Own / experience.
 - Gate questions mentioning the year.
2. Questions shall follow all the Bloom's learning levels with appropriate action verbs
3. There shall be a total of 50 questions considering 10 questions from each module, of which, 3 questions each at L1 and L2, 2 questions at L3, 1 question each at L4 and L5/L6.
4. Ensure the coverage of all Cos.

Deena

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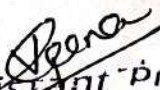
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S J C INSTITUTE OF TECHNOLOGY, CHICKABALLAPUR
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
TUTORIALS 2/ASSIGNMENT

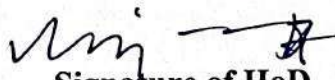
Subject: PROBLEM SOLVING USING C PROGRAMMING

Sub Code: 21PSP13

Semester:-I

1. What are control statements? Explain. Differentiate while and do-while.
2. Explain for and nested for loop with syntax and example.
3. Write a program
 - To compute GCD and LCM of two numbers using Euclid's method.
 - To compute the roots of a quadratic equation given the three co-efficient a, b, c.
 - To compute factorial of a given number
 - To check whether a number is palindrome or not.
 - To find given number prime or not.
4. Define array. Explain how to declare and initialize 1-D and 2-D arrays with examples.
5. Write a program to evaluate a polynomial equation of degree N using arrays.
6. Write a program to add two matrices and multiply two matrices using 2D arrays.
7. Write a program to add even and odd numbers in the array and find average of all elements in the array.
8. Write a program to sort the elements of an array
 - using bubblesort.
 - using selection sort.
9. Write a C program to search for an element in an array
 - using linear search.
 - using binary search.
10. Write C program to generate Pascal's triangle.
11. Explain how strings are declared and initialized. Explain gets() puts() getchar() putchar() with example.
12. Write a c program to
 - concatenate two strings
 - Stringcopy(str1,str2) that copies a str1 to another str2.
 - Reverse a given string.
13. Explain String Manipulation Functions with an example programs.


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S.J.C. INSTITUTE OF TECHNOLOGY
Department of Computer Science & Engineering

Subject & Code: Problem Solving through Programming(21PSP13)

Tutorial -1/Assignment Questions

Semester: I

1. Explain basic structure of C program with an example program.
2. Define computer. Explain basic building blocks of computer.
3. What is a computer? Explain different types of computer.
4. Write 'C' expressions corresponding for corresponding mathematical expressions.
5. Evaluate the expressions. (refer class work)
6. Differentiate between primary memory and secondary memory.
7. Explain generations of computer in detail.
8. Mention different types of operators and explain any 4 in detail.
9. Write a c program to compute sum and average of two numbers. Draw the flow chart for the same
10. Explain formatted input and output statement with examples.
11. What are branching statements? list all conditional branching statements and explain any three with an example
12. Write a C program to find the eligibility for voting. Draw the flowchart for the same.
13. Write C program to find the given number is even or odd.
14. Explain conditional operator/ternary operator with an suitable example.
15. Write a C program for simulation of simple calculator.

Deena

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Internal Test Question Paper format- 2021 Scheme

Name of the Staff: Prof. Gavina CG, MAdhu R, Manjunath P V

Date: 25/01/2022

Signature:

Reviewer's Signature:

NOTE: Only the following information's to be given to the students

S.J.C. Institute of Technology

Department of Computer Science and Engineering

Test: I

Subject Name & Code: Problem solving through Programming, 21PSP14

Semester: I-A, C, D

Duration: 90 minutes

Max Marks: 50

Date:-29/01/2022

Answer the following questions by selecting one full question from each part.

Q.No.	Question	Marks	CO	Levels
1.	List and Explain the generations of computer in detail?	8M	CO2	L2
OR				
2.	What is a computer? Briefly discuss the different types of computer?	8M	CO2	L2
3.	With a neat block diagram of computer, Explain its components?	8M	CO1	L2
OR				
4.	With a neat sketch, briefly describe any 4 input devices in detail?	8M	CO1	L2
5.	What are conditional branching statements? Explain any three with an example	8M	CO3	L2
OR				
6.	Write a C program to evaluate the simple calculator problem.	8M	CO3	L2
7.	a) Write 'C' expressions corresponding for corresponding mathematical expressions. i) Area = $\sqrt{s(s-a)(s-b)(s-c)}$ ii) $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ iii) $\sin(b/\sqrt{a^2+b^2})$ iv) $[2BY/a + 1 - x/3(2+y)]$ b) Explain basic structure of C program with an example.	2M 6M	CO3	L2
OR				
8.	Evaluate the expressions. i) $22+3<6\&\&!5 22==7\&\&22-2>+5$ ii) $100\%20<=20-5+100\%10-20==5>=11=20$ iii) $x=a-b/3+c*2-1$ where $a=0, b=12, c=3$ iv) $a+2*b !c\&\&a==d*a-2<=e$ where $a=11, b=6, c=0, d=7, e=5.$	8M	CO3	L2
9.	Write a C program to find the eligibility for voting. Construct the flowchart for the same.	8M	CO3	L3
OR				

10.	Write a c program to compute sum and average of three numbers. Construct the flow chart for the same.	8M	CO3	L3
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Multiple Choice Questions

Sl. No.	Question	Marks	CO	Levels
1.	All keywords in C are in _____ a) Lower Case letters b) Upper Case letters c) Camel Case letters d) None of the mentioned	1M	CO3	L1
2.	Which of the following is not a valid C variable name? a) int number; b) float rate; c) int variable count; d) int \$main;	1M	CO3	L1
3.	Who is the father of C language? a) Steve Jobs b) James Gosling c) Dennis Ritchie d) Rasmus Lerdorf	1M	CO1	L1
4.	What is the output of the following int main() { int a=0; a=printf("4"); printf("%d",a); return 0; } a)04 b)compiler error c)40 d)41	1M	CO3	L1
5.	Which of the following is not a correct variable type? a) float b)real c)int d)double	1M	CO3	L1
6.	Which is valid C expression? a) int my_num = 100,000; b) int my_num = 100000; c) int my num = 1000; d) int \$my_num = 10000;	1M	CO3	L1
7.	What is the output of the following? #include<stdio.h> main() { int x = 5; if(x=5) { if(x=5) printf("Hello"); } printf("Hi"); } a)HelloHi b)hello c)hi d)compile error	1M	CO3	L1
8.	Operator % in C Language is called? a)Percentage Operator b) Quotient operator c)Modulus d)Division	1M	CO3	L1

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Scheme & Solutions

Test - 1

Semester: 1 Subject Title: Problem Solving Through Programming Subject Code: 21PSP13

Question Number	Solution	Marks
1	<p>List and Explain the generations of computer in detail?</p> <ol style="list-style-type: none"> 1. First Generation Computers 2. Second Generation Computers 3. Third Generation Computers 4. Fourth Generation Computers 5. Fifth Generation Computers <p>Explanation</p>	2x4=8M
2	<p>What is a computer? Briefly discuss the different types of computer?</p> <p>Computer is an electronic device which accepts input, processes data, stores information and produces output.</p> <ol style="list-style-type: none"> 1. Supercomputers 2. Mainframes 3. Minicomputers/Midrange computers 4. Microcomputers 5. Smart phones <p>Explanation</p>	2M 6M
3	<p>With a neat block diagram of computer, Explain its components?</p> <div style="text-align: center;"> </div> <p>Explanation</p>	2M 6M
4	<p>With a neat sketch, briefly describe any 4 input devices in detail?</p> <ol style="list-style-type: none"> 1. Keyboard 2. Pointing Device 3. Scanners 4. Light Pen 5. OCR <p>Explain any four</p>	4x2=8M
5	<p>What are conditional branching statements? Explain any three with an example</p> <ol style="list-style-type: none"> 1. if statement 2. if else statement 3. nested if statement 	2M



4. else if ladder
5. switch statement

Explain any three with syntax, flowchart and example program.

3x2=6M

6

Write a C program to evaluate the simple calculator problem.

```
printf("enter the value of two integers\n");
scanf("%d%d",&a,&b);
printf("+ add\n-sub\n*mul\n/div",\n);
printf("please enter the choice\n");
scanf("%c",&ch);
switch(ch)
{
case '+': res=a+b;
printf("result of addition=%d",res);
break;
case '-': res=a-b;
printf("result of subtraction=%d",res);
break;
case '*': res=a*b;
printf("result of multiplication=%d",res);
break;
case '/': res=a/b;
printf("result of division=%d",res);
break;
default: printf("invalid choice\n");
}
```

8M

7a

Write 'C' expressions corresponding for corresponding mathematical expressions.

- i) $\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$
 $\text{area} = \text{sqrt}(s*(s-a)*(s-b)*(s-c))$
- ii) $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 $x = \frac{-b \pm \text{sqrt}(b*b - 4*a*c)}{2*a}$
- iii) $\sin(b/\sqrt{a^2+b^2})$
 $\sin(b/\text{sqrt}(a*a+b*b))$
- iv) $[2BY/a + 1 - x/3(2+y)]$
 $[2*B*Y/a + 1 - x/3*(2+y)]$

1x1/2=
4M

7b

Explain basic structure of C program with an example.

- Documentation section
- Link section
- Definition section
- Global declaration section
- main() Section


```
{
  Declaration part
  Executable part
}
```
- Sub program section
 - Function 1
 - Function 2
 -

2M

Function n
Explanation with example program

2x2=4M

8

Evaluate the expressions.

i) $22+3<6\&\&15\|\|22==7\&\&22-2>+5$
 $22+3<6\&\&15\|\|22==\&\&22-2>5$
 $22+3<6\&\&0\|\|22==7\&\&22-2>5$
 $25<6\&\&0\|\|22==7\&\&20>5$
 $0\&\&0\|\|22==7\&\&1$
 $0\&\&0\|\|0\&\&1$
 $0\|\|0$
 0

2M

ii) $100\%20<==20-5+100\%10-20==5>=1!=20$
 $0<==20-5+0-20==5>=1!=20$
 $0<==15+0-20==5>=1!=20$
 $0<==5==5>=1!=20$
 $0<==5==5>=1!=20$
 $0==1!=20$
 $0!=20$
 1

2M

iii) $x=a-b/3+c*2-1$ where $a=0, b=12, c=3$
 $9-12/3+3*2-1$
 $9-4+3*2-1$
 $9-4+6-1$
 $5+6-1$
 $11-1$
 10

2M

iv) $a+2*b\|\|c\&\&a==d*a-2<=e$ where $a=11, b=6, c=0, d=7, e=5$.
 $11+2*6\|\|0\&\&11==7*11-2<=5$
 $11+2*6\|\|1\&\&11==7*11-2<=5$
 $11+12\|\|1\&\&11==77-2<=5$
 $23\|\|1\&\&11==75<=5$
 $23\|\|1\&\&11==0$
 $23\|\|1\&\&0$
 $23\|\|0$
 1

2M

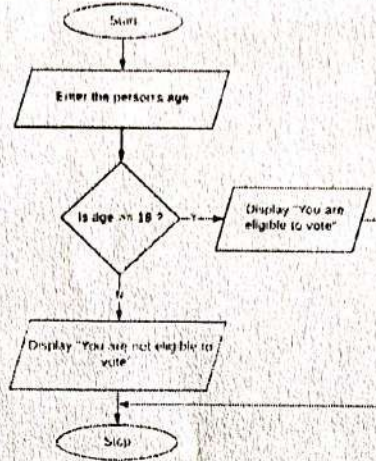
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Write a C program to find the eligibility for voting. Construct the flowchart for the same.

```
#include <stdio.h>
void main()
{
    int age;
    printf("Enter the person age ");
    scanf("%d",&age);
    if (age>=18)
    {
        printf("you are eligible to vote");
    }
    else
        printf("You are not eligible vote.\n");
}
```

4M

Assistant Professor
Department of Computer Science & Engg
JCT Institute of Technology



4M

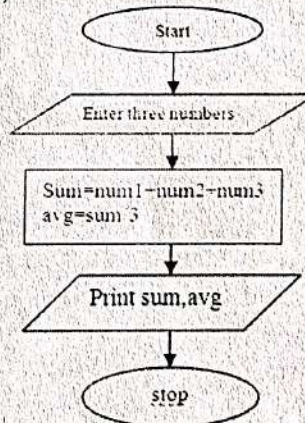
10

Write a c program to compute sum and average of three numbers. Construct the flow chart for the same.

```

int num1, num2, num3, sum, avg;
printf("Enter three Numbers: ");
scanf("%d %d %d",&num1, &num2, &num3);
sum = num1 + num2 + num3;
avg = sum / 3;
printf("Entered numbers are: %d, %d and %d\n",num1, num2, num3);
printf("Sum=%d\n", sum);
printf("Average=%d\n",avg );
  
```

4M



4M

Multiple Choice Answers

1. a) Lower Case Letters
2. d) int \$main;
3. c) Dennis Ritchie
4. d) 41
5. b) real
6. b) int my_num=100000;
7. a) HelloHi
8. c) Modulus
9. a) #
10. b) 3

10x1=
10M

[Signature]
Assistant Professor
Signature of Subject faculty
Department of Computer Science & Engg.
SJC Institute of Technology
Chickballapur-562101

[Signature]
Signature of Reviewer

[Signature]
Signature of HOD
Professor & HOD,
Department of Computer Science &
S.J.C. Institute of Technol
Chickballapur-562 10

|| Jai Sri Gurudev ||
S J C INSTITUTE OF TECHNOLOGY, CHICKBALLAPUR
 Department of Computer Science & Engineering
CO-PO Mapping

Name of the staff/s: GAVINA C G, MADHU R, MANJUNATH PV

Subject: Problem Solving Through Programming

Sub code: 21PSP13

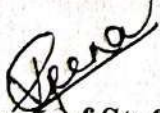
Semester: I

Course Outcomes:

At the end of the course students should be able to:

CO1	Recognize the hardware parts and software types in a computer.
CO2	Elucidate the basic architecture and functionalities of a Computer
CO3	Apply programming constructs of C language to solve the real world problem
CO4	Explore user-defined data structures like arrays, structures and pointers in implementing solutions to problems like searching and sorting
CO5	Design and Develop Solutions to problems using modular programming constructs using functions. .

CO-PO Mapping												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	-	2	-	-	-	2	-	-	-
CO2	3	2	3	-	2	-	-	-	2	-	-	-
CO3	3	3	2	3	2	2	-	-	2	-	-	2
CO4	2	3	2	3	2	-	-	-	2	-	-	2
CO5	2	2	2	3	2	3	-	-	2	-	-	2
1: Slightly 2: Moderately 3: Substantially												


 Signature of Staff
Assistant Professor
 Department of Computer Science & Engg.
 SJC Institute of Technology
 Chickballapur-562101


 Signature of Reviewer

SJCIT/NBA/
COURSE/
2021-22



S J C INSTITUTE OF TECHNOLOGY
Chickballapur - 562 101
Department of Mechanical Engineering

Course Information

Programme Name:	Mechanical Engineering						
Academic Year:	2021-22	Semester:	1	Section:	A	Subject Type:	Theory
Course Title:	Problem Solving through Programming						
Course Instructor Name:	Gavina CG					Class Strength:	
Subject Code:	21PSP 14	Course No:	3	Course ID:	C103		11

Scheme of Teaching & Marks

Contact Hr/Week:	2	Lecture Hours (Hr.):	40	Tutorials (Hr.):	-38
Max.CIE Marks:	50	Max. SEE Marks:	50	Total Max.Marks:	100
Min.CIE Marks:	18	Min.SEE Marks:	18	Total Min.Marks:	36
Final CIE (IA) Marks:	50	Assignment Marks:	20	Test Marks:	30

Threshold Values for Attainment Calculation

Final CO Attainment

Attainment level	3	%	2	%	1	%	(Percentage Contribution, %)						
Internal Assessment	>=	60	>=	55	>=	50	CIE	50	50	40			
SE Examination	>=	55	>=	50	>=	45	-			CES	10		

Statements of Course Outcomes

No.of CO's

5

Target(%)

BL

C103.1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts.	50	2
C103.2	Apply programming constructs of C language to solve the real world problem	50	3
C103.3	Explore user-defined data structures like arrays in implementing solutions to problems like	50	3
C103.4	Explore user-defined data structures like structures, unions and pointers in implementing	50	4
C103.5	Design and Develop Solutions to problems using modular programming constructs using	50	3

Semester End Exam. (SEE) Target(%)

50

Course End Survey(CES) Target (%)

60

CO-PO Mapping Table (In the scale of 3)

CO-PSO Mapping Table

CO/PO	1	2	3	4	5	6	7	8	9	10	11	12	CO/PSO	1	2	3	4
C103.1	2	2	3									1	C103.1		1		
C103.2	3	2	3									1	C103.2		1		
C103.3	3	3	2	2								2	C103.3		1		
C103.4	2	3	2	2								2	C103.4		1		
C103.5	2	2	2	2								2	C103.5		1		
Total	2.4	2.4	2.4	2								1.6	Total		1		



Course Title

Problem Solving through Programming

Course Code

C103

Subject Code

21PSP 13

Semester

1

Section

A

Emp.ID

2417

Faculty Name

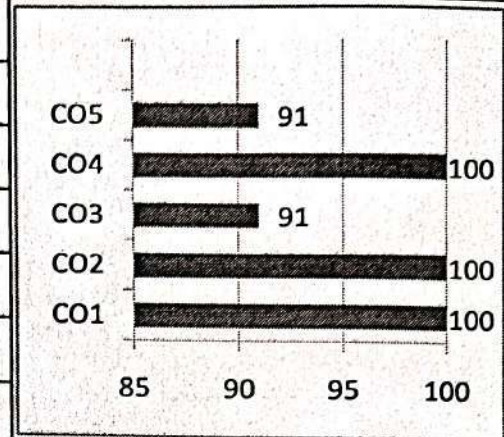
Gavina CG

No.students

11

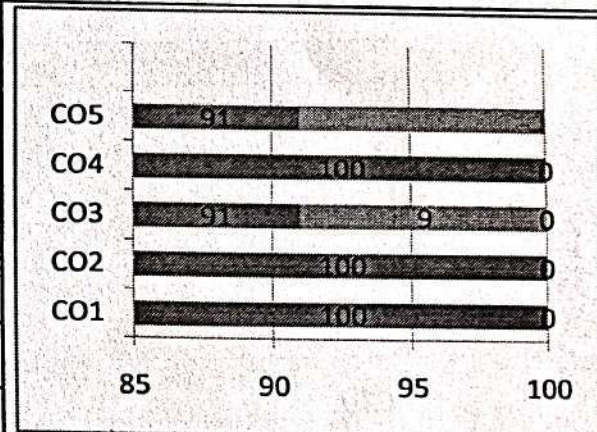
CO Attainment from -TEST - 3, in the Subject: 21PSP 13-Based on: TYPE-1, Academic Year 2021-22

Sl.	CO Number	Sum	T_Std	Av-AT	TS(=3)	AT,%	Ac_AT	ATNT
CO1	C103.1	33	11	3	11	100	3	YES
CO2	C103.2	33	11	3	11	100	3	YES
CO3	C103.3	32	11	2.9	10	91	2.7	YES
CO4	C103.4	24	8	3	8	100	3	YES
CO5	C103.5	32	11	2.9	10	91	2.7	YES



Distribution of CO Attainment from -TEST - 3, in Subj: 21PSP 13-Based on: TYPE-1, ACDY:2021-22

Sl.	CO Number	3	%	2	%	1	%
CO1	C103.1	11	100	0	0	0	0
CO2	C103.2	11	100	0	0	0	0
CO3	C103.3	10	91	1	9	0	0
CO4	C103.4	8	100	0	0	0	0
CO5	C103.5	10	91	1	91	0	91



Remarks of Course Instructor

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Signature of Course Instructor



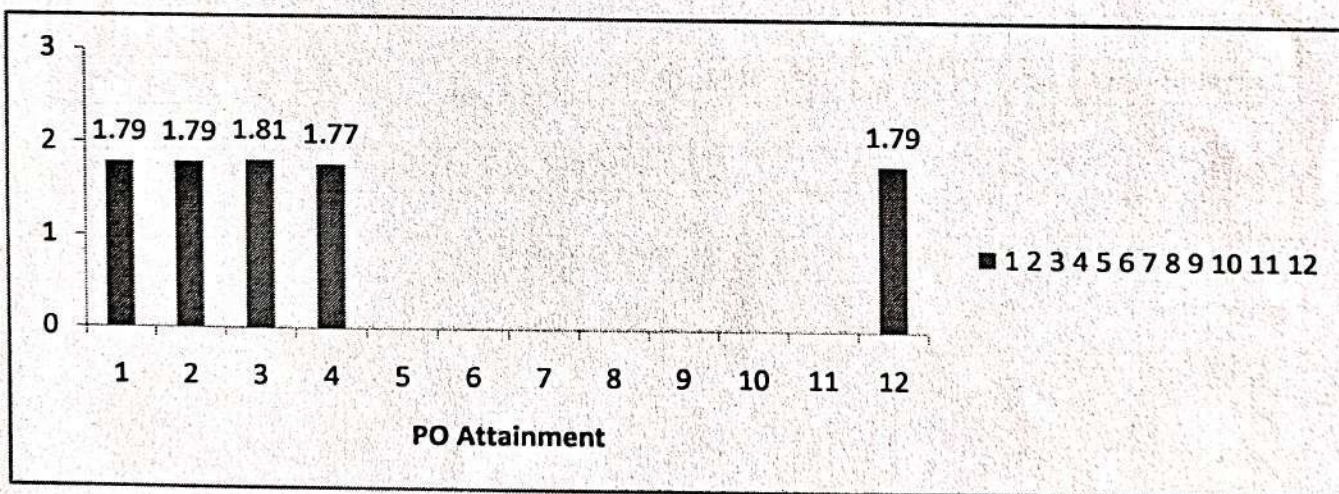
Course Title	Problem Solving through Programming				Course Code	C103	
Subject Code	21PSP 13	Semester	1	Section	A	Emp.ID	2417
Faculty Name	Gavina CG				No.students	11	

Summary of CO attainments of Sub: 21PSP 13 Based on (ACTUAL-TYPE-1) Academic Year:2021-22

CO	CID_CO	CIE			SEE			CES			TOT_Attainment		
		S_AT	T_ST	ATN	S_AT	T_ST	ATN	S_AT	T_ST	ATN	ATN	%	Status
CO1	C103.1	11	11	3	1	11	0.3	11	11	3	1.9	64	YES
CO2	C103.2	11	11	3	1	11	0.3	8	11	2.2	1.8	62	YES
CO3	C103.3	10	11	2.7	1	11	0.3	9	11	2.5	1.7	58	YES
CO4	C103.4	8	8	3	1	11	0.3	8	11	2.2	1.8	62	YES
CO5	C103.5	10	11	2.7	1	11	0.3	11	11	3	1.8	59	YES

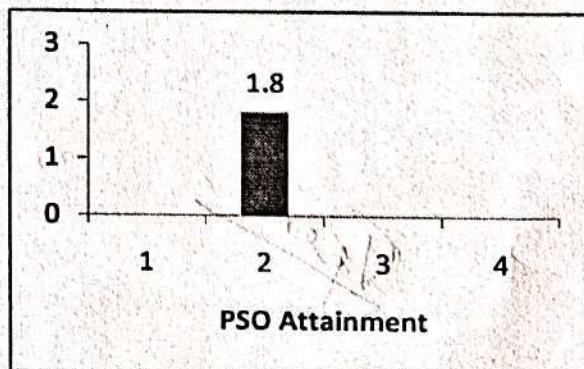
Summary of PO attainments of Sub: 21PSP 13 Based on (ACTUAL-TYPE-1) Academic Year:2021-22

PO Number	1	2	3	4	5	6	7	8	9	10	11	12
Direct ATNT(D)	1.73	1.73	1.75	1.69								1.72
Indirect ATNT(ID)	2.54	2.54	2.58	2.57								2.58
Total-ATNT	1.79	1.79	1.81	1.77								1.79



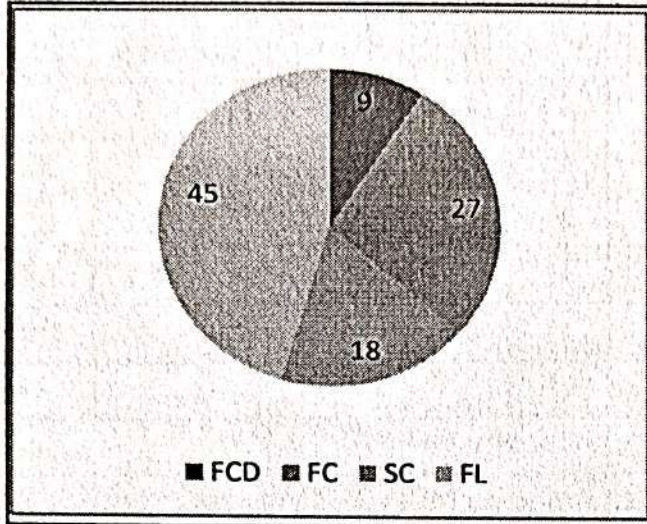
Summary of PSO attainments in Year:2021-22

PSO Number	1	2	3	4
Direct ATNT(D)		1.73		
Indirect ATNT(ID)		2.58		
Total-ATNT		1.8		





Course Title	Problem Solving through Programming				Course Code	C103	
Subject Code	21PSP 13	Semester	1	Section	A	Emp.ID	2417
Faculty Name	Gavina CG				No.students	11	
Result Analysis of Subject Code -21PSP 13 - for the Academic year 2021-22							



No. Students	Pass	%	Fail	%
11	6	55	5	45

No. Students	11	%	Grade Point
FCD	1	9	10,9,8
FC	3	27	7
SC	2	18	6,4
FL	5	45	0

CIE	AVG	SEE	AVG	TOT	AVG
50	41	50	16	100	57

Sum_AT	3
T_students	11
Avg.ATNT	0.3
Sum_AT(=3)	1
AT(=3)%	9
Attainment	NO

Grade Letter	S	A	B	C	D	E	F
Grade Point	10	9	8	7	6	4	0
No.of Students			1	3	2		
% of Students			9	27	18		

CIE and SEE correlation Coefficient	0.6
-------------------------------------	-----

Course Coordinator Remarks on Semester End Results for the Academic Year 2021-22

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Course Information

Programme Name:	Civil Engineering						
Academic Year:	2021-22	Semester:	1	Section:	A	Subject Type:	
Course Title:	Problem Solving through Programming						
Course Instructor Name:	Gavina CG				Class Strength:		
Subject Code:	21PSP 13	Course No:	3	Course ID:	C103	29	

Scheme of Teaching & Marks

Contact Hr/Week:	2	Lecture Hours (Hr.):	40	Tutorials (Hr.):	-38
Max.CIE Marks:	50	Max. SEE Marks:	50	Total Max.Marks:	100
Min.CIE Marks:	18	Min.SEE Marks:	18	Total Min.Marks:	36
Final CIE (IA) Marks:	50	Assignment Marks:	20	Test Marks:	30

Threshold Values for Attainment Calculation

Attainment level	3		2		1		Final CO Attainment (Percentage Contribution, %)			
	%		%		%		CIE	SEE	CES	
Internal Assessment	>=	60	>=	55	>=	50	50	40		
SE Examination	>=	55	>=	50	>=	45	-	10		

Statements of Course Outcomes

Statements of Course Outcomes		No.of CO's	5	Target(%)	BL
C103.1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts.			50	2
C103.2	Apply programming constructs of C language to solve the real world problem			50	3
C103.3	Explore user-defined data structures like arrays in implementing solutions to problems like			50	3
C103.4	Explore user-defined data structures like structures, unions and pointers in implementing			50	4
C103.5	Design and Develop Solutions to problems using modular programming constructs using			50	3

Semester End Exam. (SEE) Target(%)

Course End Survey(CES) Target (%):

CO-PO Mapping Table (In the scale of 3)

CO-PSO Mapping Table

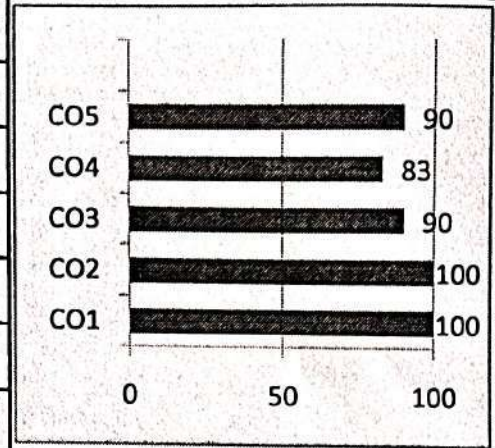
CO/PO	1	2	3	4	5	6	7	8	9	10	11	12	CO/PSO	1	2	3	4
C103.1	2	2	3									1	C103.1				
C103.2	3	2	3									1	C103.2				
C103.3	3	3	2	2								2	C103.3				
C103.4	2	3	2	2								2	C103.4				
C103.5	2	2	2	2								2	C103.5				
Total	2.4	2.4	2.4	2								1.6	Total				



Course Title	Problem Solving through Programming				Course Code	C103	
Subject Code	21PSP 13	Semester	1	Section	A	Emp.ID	2417
Faculty Name	Gavina CG				No.students	29	

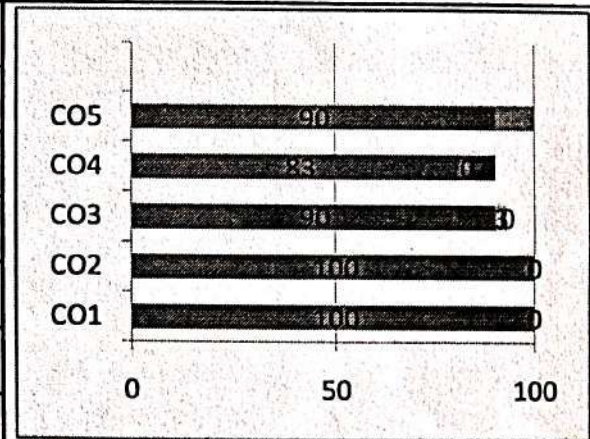
CO Attainment from -TEST - 3, in the Subject: 21PSP 13-Based on: TYPE-1, Academic Year 2021-22

Sl.	CO Number	Sum	T_Std	Av-AT	TS(=3)	AT,%	Ac_AT	ATNT
CO1	C103.1	87	29	3	29	100	3	YES
CO2	C103.2	87	29	3	29	100	3	YES
CO3	C103.3	80	29	2.8	26	90	2.7	YES
CO4	C103.4	74	29	2.6	24	83	2.5	YES
CO5	C103.5	82	29	2.8	26	90	2.7	YES



Distribution of CO Attainment from -TEST - 3, in Subj: 21PSP 13-Based on: TYPE-1, ACY:2021-22

Sl.	CO Number	3	%	2	%	1	%
CO1	C103.1	29	100		0		0
CO2	C103.2	29	100		0		0
CO3	C103.3	26	90	1	3		0
CO4	C103.4	24	83		0	2	7
CO5	C103.5	26	90	2	90		90



Remarks of Course Instructor

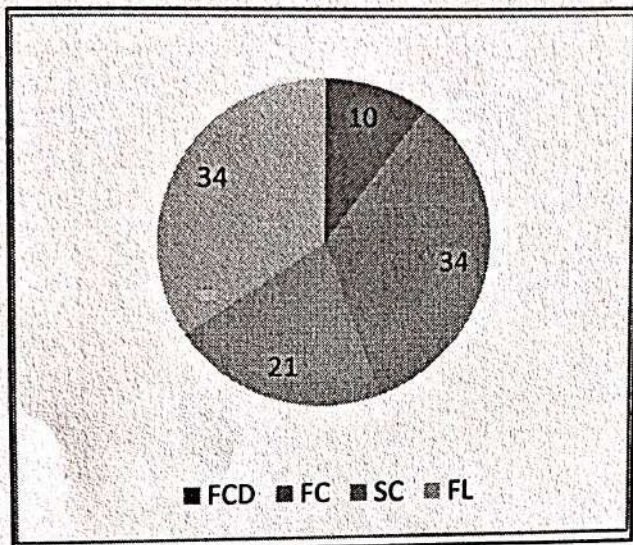
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Course Title	Problem Solving through Programming				Course Code	C103	
Subject Code	21PSP 13	Semester	1	Section	A	Emp.ID	2417
Faculty Name	Gavina CG				No.students	29	

Result Analysis of Subject Code -21PSP 13 - for the Academic year 2021-22



No. Students	Pass	%	Fail	%
29	19	66	10	34

No. Students	29	%	Grade Point
FCD	3	10	10,9,8
FC	10	34	7
SC	6	21	6,4
FL	10	34	0

CIE	AVG	SEE	AVG	TOT	AVG
50	40	50	18	100	58

Sum_AT	11
T_students	29
Avg.ATNT	0.4
Sum_AT(=3)	2
AT(=3)%	7
Attainment	YES

Grade Letter	S	A	B	C	D	E	F
Grade Point	10	9	8	7	6	4	0
No.of Students		2	1	10	6		2
% of Students		7	3	34	21		7

CIE and SEE correlation Coefficient	0.64
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Course Coordinator Remarks on Semester End Results for the Academic Year 2021-22

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Signature of Course Coordinator

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Signature HOD/DAC



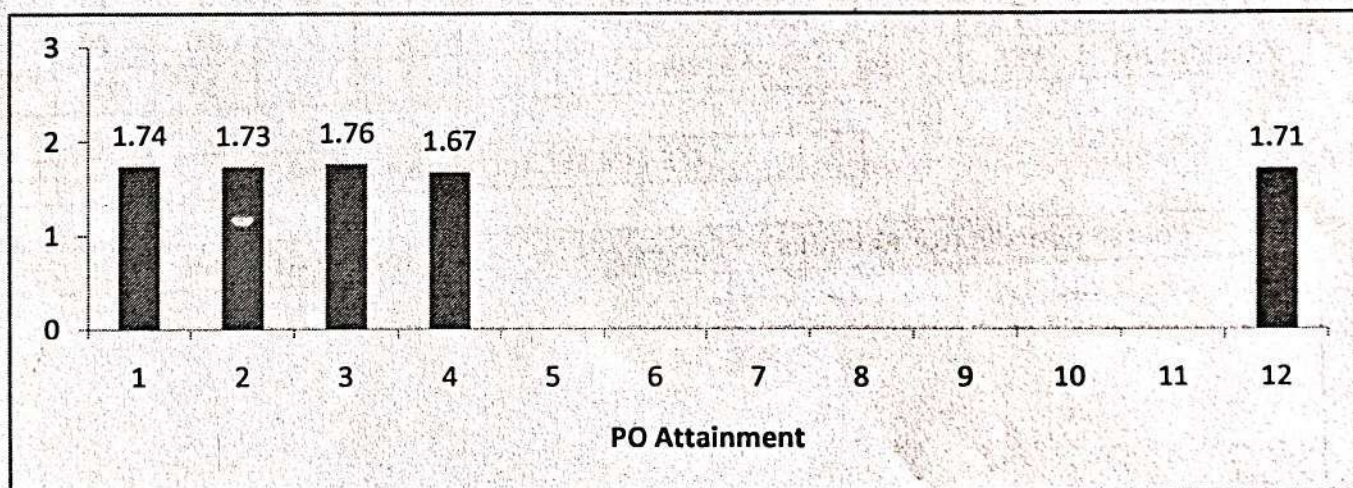
Course Title	Problem Solving through Programming					Course Code	C103
Subject Code	21PSP 13	Semester	1	Section	A	Emp.ID	2417
Faculty Name	Gavina CG					No.students	29

Summary of CO attainments of Sub: 21PSP 13 Based on (ACTUAL-TYPE-1) Academic Year:2021-22

CO	CID_CO	CIE			SEE			CES			TOT_Attainment		
		S_AT	T_ST	ATN	S_AT	T_ST	ATN	S_AT	T_ST	ATN	ATN	%	Status
CO1	C103.1	29	29	3	2	29	0.2	11	11	3	1.9	63	YES
CO2	C103.2	29	29	3	2	29	0.2	8	11	2.2	1.8	60	YES
CO3	C103.3	26	29	2.7	2	29	0.2	9	11	2.5	1.7	56	YES
CO4	C103.4	24	29	2.5	2	29	0.2	8	11	2.2	1.6	52	YES
CO5	C103.5	26	29	2.7	2	29	0.2	11	11	3	1.7	58	YES

Summary of PO attainments of Sub: 21PSP 13 Based on (ACTUAL-TYPE-1) Academic Year:2021-22

PO Number	1	2	3	4	5	6	7	8	9	10	11	12
Direct ATNT(D)	1.64	1.62	1.65	1.55								1.6
Indirect ATNT(ID)	2.54	2.54	2.58	2.57								2.58
Total-ATNT	1.74	1.73	1.76	1.67								1.71



Summary of PSO attainments in Year:2021-22

PSO Number	1	2	3	4
Direct ATNT(D)				
Indirect ATNT(ID)				
Total-ATNT				

