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BCS- 160

B. Tech. (ECE/ECE(IoT)/EE)
Year: I, Semester: II
Minor Test (Examination): 2024-2025
Introduction to C Programming

Time: 2 Hr. **Max marks: 20**

Note: Answer all questions.

Q1.		Attempt any **Two** parts of the following.	Marks	CO	BL	PO	PI Code
	a)	Write an algorithm that computes and checks whether a number is an Armstrong number or not. Also, draw the flowchart for it. Examples: 153, 1634, etc. are the Armstrong number. $153=1^3+5^3+3^3$, $1634=1^4+6^4+3^4+4^4$	4	1,2	1,2	1,2,3	1.4.1
	b)	Write a C program to check and print the prime numbers between 1 to 100. Implement break, and continue keywords in loop(s) of the program(s).	4	2, 3	1,2,3	1,2	1.4.1
	c)	Write and describe the different types of data types and storage classes. Also, explain the tokens, identifiers, and literals with suitable examples.	4	1, 2	2,3,4	2,3	1.4.1
Q2.		Attempt any **Two** parts of the following.					
	a)	Write notes on the different types of computer programming languages and translators. Print the following pattern: 4 3 4 2 3 4 1 2 3 4	3	1, 2,3	2,3,4	1,2,3	1.4.1
	b)	Describe the variable declarations and variable definitions. Write a program in C to print days of week using a switch statement.	3	1, 2, 3	2,3,4	2	1.4.1
	c)	Explain the C arrays. Write a program in C that prints even position elements of an array.	3	1, 2, 3	1,2,3	1,2	1.4.1
Q3.		Attempt any **Two** parts of the following.					
	a)	Write a program in C that finds and prints the smallest element among three numbers using nested if-else. What are qualifiers in C? Explain.	3	1, 2, 3	2,3,4	1,2,3	1.4.1
	b)	Differentiate the following: i) while and do-while loops ii) ternary operator and if-else statement iii) return and goto statements	3	1, 2	2,3,4	2	1.4.1
	c)	Write a C program to print diagonals, upper and lower tringles elements of a matrix.	3	2, 3	1,2,3	1,2	1.4.1

BL – Bloom's Taxonomy Levels (1- Remembering, 2- Understanding, 3 – Applying, 4 – Analysing, 5 – Evaluating, 6 - Creating)
CO – Course Outcomes
PO – Program Outcomes
PI Code – Performance Indicator Code

Sub Code: **BCS 160**

B. Tech. (4 Credits)

Year: I Semester: II

Even Semester 2024-2025

Introduction to C Programming

Time: 3Hr. **Max Marks: 50**

Note: Attempt All questions.

Q .1	Attempt any five parts of the following.	Marks	CO	BL	PO	PI Code
a)	What is the difference between a compiler and an interpreter? Why is C a compiled language?	2	1	1	1,2	1.4.1
b)	What is a struct in C, and how does it differ from an array?	2	2	1	1,2	1.4.1
c)	What is the difference between an array and a pointer? When should you use one over the other?	2	3	2	1,2	1.4.1
d)	How does the size-of operator work in C? What are its applications?	2	1	1	1,2	1.4.1
e)	What are function pointers? How are they declared and used in real-world applications?	2	2	2	1,2	1.4.1
f)	What is the difference between static memory allocation and dynamic memory allocation?	2	7	2	1,2	1.4.1
g)	Can we use the 'if' function to compare strings? If yes then explain with the example.	2	3	1	1,2	1.4.1
Q 2.	**Attempt any two parts of the following.**					
a)	What is a token? What are different types of tokens available in C language? Explain.	5	1	2	1,2	1.4.1
b)	Describe the purpose and usage of the following C keywords with examples: auto, extern, register, and static.	5	3	2	1,2	1.4.1
c)	Write a C program that reads an integer and checks whether it is positive, negative, or zero using if and else if statements.	5	3	3	1,2	1.4.1
Q3.	**Attempt any two parts of the following.**					
a)	Explain the difference between formal and actual arguments in C functions with examples, and demonstrate how parameter passing works in call by reference example.	5	4	3	1,2	1.4.1

b)	Define an array? How a single dimension and two-dimension arrays are declared and initialized?	5	3	2	1,2	1.4.1
c)	Differentiate between user-defined functions and standard library functions in C. Write a program that uses both types of functions: one user-defined function to check whether a number is prime.	5	3	3	1,2	1.4.1
Q4.	**Attempt any two parts of the following.**					
a)	Explain the union in C and how does it differ from a structure? Declare a union for storing different data types such as int, float, and char with examples.	5	3	2	1,2	1.4.1
b)	Which statement is more efficient between x=x+1 and x++? Explain with examples and draw a flow chart.	5	3	2	1,2	1.4.1
c)	Write an algorithm and develop a C program that reads N integer numbers and arrange them in ascending order. OR Define a recursion? Explain it with syntax and examples. Write a C-program using recursive function for Binary to Decimal Conversion.	5	1	2	1,2	1.4.1
Q5.	***Attempt any two parts of the following.***					
a)	Explain the concept of dynamic memory allocation in C. Compare the malloc(), calloc(), realloc(), and free() functions with syntax and use cases.	5	2	2	1,2	1.4.1
b)	Describe how files are managed in C. Write a C program that opens a text file, writes a list of student records (name and marks), then closes the file. Reopen the file to read and display the contents.	5	6	2	1,2	1.4.1
c)	Explain the concept of command line arguments in C. Why are they useful? Write a C program that takes two integers as command line arguments and prints their sum, difference, and product.	5	7	3	1,2	1.4.1

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