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Mysore Road, RV Vidyaniketan Post
Bengaluru - 560059, Karnataka, India

NBA Accredited (UG - 6Years)

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Department of Computer Science and Engineering

Academic year 2024 - 2025 (Even Semester)

CIE I: QUESTION PAPER

Course	**Principles of Programming using C**		
Date	May 2024	Maximum Marks	50
Course Code	CS222AI	Duration	90 Min
Sem	II	CIE – I	

SL No.	Questions	M	BT	CO
1.a	Discuss about the five generations of programming languages.	06	L2	CO1
1.b	Draw a flowchart to find the largest of 3 numbers.	04	L2	CO3
2.a	Write printf statements for the following: NUMBER = 0 0 0 9 . 8 NUMBER = + 9 . 8 NUMBER = 6 . 8 9 NUMBER = 6 . 8 9 0 0 0 0 0 NUMBER = 6 . 8 9 1 5 6	05	L3	CO2
2.b	Explain the structure of a C program with an example.	05	L2	CO2
3.a	In an industrial or home heating system, a thermostat might check if the current temperature exceeds a certain threshold to control the heating system. Write a C program using if-else statement to check the following conditions: i. If the temperature is above 30°C, the air conditioner is turned on; ii. if it's below 15°C, the heater is activated.	06	L4	CO3
3.b	Discuss the difference between = and == operators in C.	04	L2	CO1
4.a	Explain the usage of break statement for the following scenario: i. If the user enters the correct PIN (1234), the program will immediately **break out of the loop** and print a welcome message. ii. If the PIN is incorrect, the program will allow the user to try again, but after 3 failed attempts, it will **terminate** the loop and deny access.	06	L4	CO3
4.b	Briefly discuss the C Tokens.	04	L2	CO1
5.a	Write a C program to insert an element into the middle of an array.	05	L3	CO2
5.b	Explain two types of initializations in 1D arrays with suitable syntax and example.	05	L3	CO4

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Academic year 2024 - 2025 (Even Semester)

CIE II: QUESTION PAPER

Course	**Principles of Programming using C**		
Date	June 2025	Maximum Marks	50
Course Code	CS222AI	Duration	90 Min
Sem	II	CIE – II	

SL No.	Questions.	M	BT	CO
1.a	Explain the different functions used to perform string input operation. Illustrate with an example for each.	06	L2	CO1
1.b	Design a program to count number of digits, upper case characters, lower case characters and special characters in a given string.	04	L2	CO1
2.a	What are strings? Describe and develop any three operations that can be performed on strings.	06	L3	CO2
2.b	Construct a program to find the transpose of a given Matrix.	04	L3	CO2
3.a	Define a structure named "Time" with members hours, minutes, and seconds. Write a C program to input two times, add them, and display the result in proper time format.	06	L4	CO3
3.b	Consider a 10x5 two-dimensional array Marks which has base address = 2000 and the number of words per memory location of the array = 2. Now compute the address of the element -Marks [8][4] assuming that the elements are stored in i. Row major order ii. Column major order	04	L3	CO1
4	Differentiate between an iterative function and recursive function. Which one will you prefer to use and in what circumstances. Design a program to find power of a number using recursion and iterative function.	10	L3	CO3
5.a	Differentiate between #define and typedef with an example	04	L1	CO2
5.b	Discuss the ways in which structure can be passed to function. Illustrate with an example for each.	06	L2	CO1

Course Outcomes: After completing the course, the students will be able to:-	
CO 1	Apply logical skills to solve the engineering problems using C programming constructs
CO 2	Evaluate the appropriate method/data structure required in C programming to develop solutions by investigating the problem.
CO 3	Design a sustainable solution using C programming with societal and environmental concern by engaging in lifelong learning for emerging technology.
CO 4	Demonstrate programming skills to solve inter-disciplinary problems using modern tools effectively by exhibiting team work through oral presentation and written reports

BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

Marks Distribution	Particulars	CO1	CO2	CO3	CO4	L1	L2	L3	L4	L5	L6
	Test Max Marks	20	14	16	-	4	16	24	6	-	-

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Date: July 2025	**Test - 3**	**Max. Marks:**
Semester: II	**UG**	**Duration: 90 minutes**
Course Title: Principles of Programming using C		**Course Code: CS222IA**

SN	Questions	M	BT	CO
1a.	Explain the concept of a Pointers in C. List any four useful applications of Pointers.	04	L2	CO 1
1b.	Illustrate the concept of Pointers and Arrays, with a C Program to find the mean of n numbers in array.	06	L3	CO 2
2a.	Summarize in a tabular form the concept of Pointer Arithmetic for the operations: Assignment, Addition of an integer, Subtraction of an integer, Comparison of Pointers, Subtraction of pointers	04	L2	CO 1
2b.	Demonstrate the concept of passing arguments to functions using pointers, using a C Program to Calculate the area of triangle.	06	L3	CO 2
3a.	Differentiate between static memory allocation and dynamic memory allocation in C. List the general steps involved in dynamically allocating and releasing memory for an integer array.	04	L2	CO 2
3b.	Illustrate the differences between malloc() and calloc( ) for the memory allocation, using C programs to dynamically allocate memory for an array of integers, input values from the user, and display the sum of the elements.	06	L4	CO 3
4a.	Explain the key differences in using linked lists over arrays in C programming. List the different types of Linked list.	04	L2	CO 2
4b.	Develop C functions for the following operations: i) to create a Singly Linked list. ii) to insert a new node at the beginning of a Singly linked list.	06	L4	CO 3
5a.	Bring out the importance of files. Explain the different modes in which a file can be opened in C program.	04	L2	CO 1
5b.	Write a Program to read a file that contains some text, convert it to uppercase and then print it on the screen as well as write into a file.	06	L4	CO 3

Course Outcomes: After completing the course, the students will be able to:-	
CO 1	Apply logical skills to solve the engineering problems using C programming constructs
CO 2	Evaluate the appropriate method/data structure required in C programming to develop solutions by investigating the problem.
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BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

	Particulars	CO1	CO2	CO3	CO4	L1	L2	L3	L4	L5	L6
Marks Distribution	Test Max Marks	12	20	18	-	-	20	12	18	-	-

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R V Vidyanikethan Post
Mysuru Road Bengaluru - 560 059

II Semester B.E. Regular/ Supplementary Examinations- July/August - 2025.
Common to CS/IS/AIML/CD/CY/BT.
Course : Principles of Programming using C-CS222IA

Time : 3 Hours **Maximum Marks : 100**

Instructions to the students

1. Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only.
2. Answer FIVE full questions from Part B. Question number 2 and 11 are compulsory. Choose any one full question from 3 or 4, 5 or 6, 7 or 8 and 9 or 10.

Part A

Question No	Question	M	CO	BT
1.1	If a program has no errors and compiles successfully, but the output is incorrect, what kind of error is this?	01	1	1
1.2	Which of the following represents the correct sequence of sections in a well-structured C program? Justify your answer. a) main function → Preprocessor directives → Function definitions b) Preprocessor directives → main function → Global variables c) Preprocessor directives → Global declarations → main function → User-defined functions d) Global variables → main function → Preprocessor directives	01	1	2
1.3	Illustrate the role of nested loops in sorting and searching algorithms.	01	3	2
1.4	Write the complete classification types of Decision Control Statements.	02	1	1

1.5	Write the output of the given code.
	`#include <stdio.h>`
	`void display(int n) {`
	`  if (n == 0) return;`
	`  display(n - 1);`
	`  printf("%d ", n);`
	`}`
	`int main() {`
	`  display(3);`
	`  return 0;`
	`}`
		02	3	4

1.6	Complete the missing statement in the below code, code is to delete a node, where *ptr, *preptr are the pointers to the struct node, val is the values to be deleted in the linked list.
	`ptr = start; // start is the starting of the linked list`
	`if(ptr -> data == val)`
	`{`
	`start = _____`
		02	4	4

```
free (_____);
}
else
{
while(ptr -> data != val)
{
preptr = _____;
ptr = _____;
}
preptr -> next = _____
free(ptr);
}
```

1.7	What is a linked list?	01	1	1

Part B

Question No	Question	M	CO	BT
2a	A,B,C,D and E are good friends. C is the tallest among all. A is shorter than B but taller than E. D is little shorter than B but little taller than A. Who is taller than E but shorter than D?	04	2	3
2b	If John can drink one barrel of water in 6 days, and Mary can drink one barrel of water in 12 days, how long would it take them to drink one barrel of water together?	04	2	3
2c	Differentiate between. i) Hardware and Software ii)System software and Application Software Give an example for each.	06	1	1
3a	Compare and contrast while and do-while loops in C with suitable examples.	05	1	2
3b	Implement a C program to assign grades to a student based on marks scored using else-if ladder.	05	2	3
3c	Write C code to demonstrate a 2-dimensional array of size 5X5. Assign 0 to all elements and -1 at the diagonal.	04	3	3
	OR			
4a	Can a for loop be used without the initialization or the iteration part? Explain with an example.	04	2	2
4b	Illustrate the working principles of various types of decision control structures in C with syntax and suitable example C Code.	10	2	3
5a	Write a program to simulate the strcpy and strcmp functions.	04	2	3
5b	Write a program to perform the following operations using user defined functions.	10	3	4

i) To read n integer numbers from the user

ii) To print largest of n numbers and its position c.

iii) To print smallest of n numbers and its position

OR

6a	What are global variables, local variables and their scope?	04	1	1
6b	Explain how strings are represented in main memory.	05	2	2
6c	Discuss different categories of C functions with proper examples.	05	2	2
7a	How are structures different from arrays? Explain with an example	05	3	3
7b	Illustrate the use of pointers in accessing and modifying elements of an array, with the help of a C code	05	3	3
7c	How to declare and initialize pointer variables?	04	2	2

OR

8a	Discuss the difference between struct and typedef in C with an example?	04	2	2
8b	Implement a program to add and subtract distances 6 km and 300 m and 4 km and 700 m using structures.	05	3	4
8c	Demonstrate by Implementing a C program to swap two numbers using functions and pointers.	05	4	3
9a	Write a Program to read a file that contains some text, convert it to uppercase and then print it on the screen as well as write into a file.	10	3	4
9b	How does dynamic memory allocation improve program efficiency? Explain with use cases such as linked lists, matrices, and file buffers.	04	2	2

OR

10a	Write a C program that dynamically allocates memory to store temperature readings for multiple cities over a week, calculates average temperature, and identifies cities with abnormal temperature patterns.	10	4	4
10b	Write a C function to count the number of nodes in a singly linked list.	04	3	3
11a	Develop a C program that reads N integer numbers and arrange them in ascending or descending order using selection sort and bubble sort technique.	10	3	3
11b	Implement a C program that checks whether two strings are equal using a pointer to a function designed for string comparison.	10	4	4