Roll No. | | | | | | | | | | |

**ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)**

**B.E. / B. Tech - END SEMESTER ARREAR EXAMINATIONS, APRIL / MAY 2024**

Common to ALL Branches

**EE5001 & C Programming**

(Regulation 2019)

Time: 3 hrs. Maximum Marks: 100

| | |
|---|---|
| CO 1 | To understand the basic concepts in C Programming Language. |
| CO 2 | To introduce the students to the basic data structures such as arrays, stacks and queues |
| CO 3 | To teach the concepts of pointers and string handling in C |
| CO 4 | To learn about files and various operations on files |
| CO 5 | To develop C programs for implementing simple data structures, sorting and searching techniques |

**BL – Bloom's Taxonomy Levels**

(L1 - Remembering, L2 - Understanding, L3 - Applying, L4 - Analyzing, L5 - Evaluating, L6 – Creating)

## PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

| Q. No | Questions | Marks | CO | BL |
|---|---|---|---|---|
| 1 | What are preprocessor directives? | 2 | 1 | L1 |
| 2 | How will an expression be evaluated when two or more operators at same operator precedence level are in it? | 2 | 1 | L2 |
| 3 | Differentiate call by value and call be reference. | 2 | 2 | L4 |
| 4 | Define recursive functions. | 2 | 2 | L1 |
| 5 | Write a short code snippet to iterate over and print a string in C. | 2 | 3 | L3 |
| 6 | List two dynamic memory allocation functions in C with their syntax and usage. | 2 | 3 | L1 |
| 7 | What are enumerated types? | 2 | 4 | L1 |
| 8 | How to open a file in text or binary mode in C? | 2 | 4 | L2 |
| 9 | What is linear search? | 2 | 5 | L1 |
| 10 | Name two sorting methods used to sort arrays. | 2 | 5 | L1 |

## PART- B (5 x 13 = 65 Marks)

(Restrict to a maximum of 2 subdivisions)

| Q. No | Questions | Marks | CO | BL |
|---|---|---|---|---|
| 11 (a) (i) | Write a C program to determine whether a given number is a palindrome number or not. Let x be a number and y be the number with digits reversed of x then a number is said to be a palindrome number only if x equals y. For example, x=1221 and y=1221. | 8 | 1 | L6 |
| (ii) | Explain briefly the different control statements used in the above program. | 5 | 1 | L3 |
| | **OR** | | | |
| 11 (b) (i) | Write a C program to print all prime numbers in the given range (a, b). For example, if a given range is a=2 and b=100, the program should print all prime numbers between 2 and 100 (inclusive of limits). | 8 | 1 | L6 |
| (ii) | Explain briefly the different types of operators and expressions used in the above program while describing each expression's evaluation. | 5 | 1 | L3 |
| 12 (a) (i) | Explain with illustrative code examples the syntax and working mechanism of different types of functions in C. | 13 | 2 | L1 |
| | **OR** | | | |
| 12 (b) (i) | Describe with illustrative code examples the syntax and working mechanism | 13 | 2 | L1 |

| | | | | |
|---|---|---|---|---|
| | of different types of Arrays in C. | | | |
| 13 (a) (i) | Write a C function void rearrange (int *arr, int order) which takes integers and order as input arguments, arranges them in ascending order if input argument order = 1 and in descending order when order = 0. Also, write a main program to demonstrate the function by creating and passing arguments as required. | **8** | 3 | L4 |
| (ii) | Discuss the working mechanism of the above program while describing clearly how arrays are passed as arguments to functions. | **5** | 3 | L3 |
| | **OR** | | | |
| 13 (b) (i) | Write a C program which takes as input two matrices A and B, Checks the matrices for dimension compatibility for performing multiplication. Determines the resultant matrix R by computing the product of A and B. Represent the arrays used in pointer representation without using index operators. | **8** | 3 | L4 |
| (ii) | Discuss the working mechanism of the above program while describing the relationship between pointers and arrays. | **5** | 3 | L3 |
| 14 (a) (i) | Write a C program using structures to maintain the details of 10 books in a bookstore like Book Number, Book Name, ISBN, Author Name, and Price. Use appropriate functions to get the data, display the data, and find the total cost of inventory in the list. Also, describe the constructs used in detail. | **13** | 4 | L3 |
| | **OR** | | | |
| 14 (b) (i) | Write a C program to create a file named "hello.txt", write the sentence - "Hello! Good morning! Have a good Day!" into it and read the written lines from the file and display it. Also, describe the functions used in detail. | **13** | 4 | L3 |
| 15 (a) (i) | Write a C program to implement a Queue data structure using arrays. Also, list some applications scenarios. | **13** | 5 | L3 |
| | **OR** | | | |
| 15 (b) (i) | Write a C program to implement a Stack data structure using arrays. Also, list some application scenarios. | **13** | 5 | L3 |

## PART- C (1 x 15 = 15 Marks)

(Q.No.16 is compulsory)

| Q. No | Questions | Marks | CO | BL |
|---|---|---|---|---|
| 16.(i) | Develop a C program using suitable choice of functions to implement a simple calculator which prints the following menu based on the user choice of operation.<br><br>*Operation Menu: 1. Add 2. Subtract 3. Multiply 4. Divide 5. Quit*<br><br>*Enter your choice:*<br><br>Depending on the operation choice, the program should display the user's operation and result. The menu should repeat if the user does not enter 5 to quit. For example, if the user gives the choice as 1, then addition must be performed, getting two operands from the user and printing the result. | **15** | 4 | L6 |