

**I B. Tech I Semester Regular/Supplementary Examinations, February - 2023****PROGRAMMING FOR PROBLEM SOLVING USING C**

(Common to EEE, ME, ECE, CSE, CSE-CS&T, EIE, IT, ECT, Auto Eng, Min Eng, Pet Eng, CSE-AI&ML, CSE-AI, CSE-DS, CSE-AI&DS, CSE-CS, CSE-IOT & CS Incl BCT, CSE-CS & BS, CSE-IOT, Food Eng, AI&DS)

Time: 3 hours

Max. Marks: 70

*Answer any FIVE Questions ONE Question from Each Unit**All Questions Carry Equal Marks*

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**UNIT – I**

1. a) How are the expressions evaluated in C? Explain the role of precedence and associativity in it. Give example. [7M]
- b) Illustrate the various storage classes used in C program. Explain each with a simple program. [7M]

**(OR)**

2. a) What is scope of variable? Explain block scope, function scope program scope and file scope with an example program [7M]
- b) Write a C program to count number of vowels in an input text taken through command line arguments. [7M]

**UNIT – II**

3. a) Read the marks of eight subjects and calculate the percentage of marks. The program should output following grades based on percentage of marks obtained in the eight subjects. Use nested if statement to write the code. [7M]

|                  |           |           |       |              |              |
|------------------|-----------|-----------|-------|--------------|--------------|
| Percentage Marks | 80 to 100 | 70-79     | 60-69 | 50-59        | Less than 49 |
| Grade            | Excellent | Very Good | Good  | Satisfactory | Fail         |

- b) What is a loop? Explain different statements in C with example. [7M]

**(OR)**

4. a) Explain different bitwise operators available in C with examples. [7M]
- b) What is the need of do-while and while loops? Discuss about their usage. Distinguish between them. [7M]

**UNIT – III**

5. a) Using structures write a program to read and display the information of all the students in a class. [7M]
- b) Write a short note on operations on arrays. And write a program to print the position of smallest of 'n' numbers using arrays. [7M]

**(OR)**

6. a) Write a C Program to find number of characters in a given string without using library function. [7M]
- b) What are subscripted variables? How one and two dimensional subscripted variables (arrays) are declared? [7M]

**UNIT – IV**

7. a) What is a dangling memory? Why addition of two pointers is impossible? [7M]  
b) Explain the term dynamic memory allocation and the terms malloc(), calloc and realloc() functions. [7M]

**(OR)**

8. a) Write a C program that access elements of 1D array using a pointer variable [7M]  
b) How to initialize and access pointer variable? Explain pointer to a function with example [7M]

**UNIT – V**

9. a) Write a C program to read a data file containing integers. Find the largest and smallest integers and display them [7M]  
b) Write program for finding the GCD among two numbers using recursion. [7M]

**(OR)**

- 10 a) Explain the following functions in files: [7M]  
(i) fseek( ) (ii) ftell( ) (iii) rewind( ) (iv) fopen( ) (v) fclose( ) (vi) foef( )  
b) What is Recursive Function? What are the constraints for defining a Recursive Function? Explain with an example. [7M]

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**UNIT - I**

1. a) What is an Expression? Write the priority and associativity of different arithmetic operators in C. Evaluate  $2+4*5/2-2/4+2\%5$ . [7M]
- b) Explain the basic data types supported by C language and discuss their features. [7M]

**(OR)**

2. a) List out the various category of operators available in c? Give examples. [7M]
- b) Explain the basic structure of C program and explain the significance of each Section. [7M]

**UNIT – II**

3. a) Explain in details about multi-way selection statements with example. [7M]
- b) Write a program to print the following series on the screen [7M]  
1  
1 2  
1 2 3  
1 2 3 4  
1 2 3 4 5

**(OR)**

4. a) What is meant by pre-test and post-test loop? Write a C program to find factorial of given number using for loop. [7M]
- b) What is Shift operation? Perform different types of shift operations on 101110011. [7M]

**UNIT – III**

5. a) Write a C program to check whether a given string is palindrome or not.(without using any built-in string function). [7M]
- b) What are the unions? How are they different from structures? Give an example for Union. [7M]

**(OR)**

6. a) Create a structure of employees having the following information: Employee id, Employee name, Date of joining, Salary. Write a C program to input information of 20 employees and display the details of the specified employee given the employee id. [7M]
- b) Develop a C program to find the length of the Given string without using predefined functions. [7M]

**UNIT – IV**

7. a) What is a pointer? Explain declaration, initialization and accessing of a pointer Variable. [7M]
- b) In detail explain the pointers and arrays of 2D and 3D with suitable examples. [7M]

**(OR)**

8. a) What is address arithmetic in C? Explain different arithmetic operations that can be performed on pointers. [7M]
- b) What is the role of L value and R Value in pointer arithmetic? Explain in detail. [7M]

**UNIT – V**

9. a) Explain the following functions in file operations: [7M]  
(i) getw( ) (ii) putw( ) (iii) fscanf( ) (iv) fprintf( )
- b) What is an user defined function? When these functions are useful? How a function is declared and what are the rules followed to call a function. [7M]

**(OR)**

- 10 a) Write a C program to copy the content of one file into another file. [7M]
- b) Explain about call by value and call by reference with reference to functions. Write a function to swap the values between the variables using call by value and call by reference. [7M]

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**UNIT – I**

1. a) Explain, in detail, storage classes available in C language with examples. [7M]
- b) Discuss about operator precedence in expression evaluation with a suitable example. [7M]

**(OR)**

2. a) Explain different types of operators available in C language with examples. [7M]
- b) What is meant by type conversion? Why is necessary? Explain about implicit and explicit type conversion with examples. [7M]

**UNIT – II**

3. a) Write a note on [7M]  
(i) Bitwise operator (ii) Conditional operator  
(iii) Size of operator (iv) logical operators.
- b) Write a C program to check whether the given number n is prime or not. [7M]

**(OR)**

4. a) How does a switch statement works? List the difference between switch and if else ladder statement. [7M]
- b) What is the need of do-while and while loops? Discuss about their usage. Distinguish between them. [7M]

**UNIT – III**

5. a) What is an array? How to store elements in an array? Develop a C program to count sum of even numbers in a given array. [7M]
- b) What is string palindrome? Develop a program to check whether the given string is palindrome or not? [7M]

**(OR)**

6. a) What is a union? For what kind of applications are unions are useful? Explain the unions with an example. [7M]
- b) Define string? Explain built-in functions for handling strings. [7M]

**UNIT – IV**

7. a) How are generic pointers different from pointer variables and also differentiate ptr++ and ++ptr. [7M]
- b) Write a C program that access elements of 1D array using a pointer variable. [7M]

**(OR)**

8. a) Differentiate pointers, variables and arrays. Write a C program to implement array pointers. [7M]
- b) Write a C program to reverse the given string using a pointer. [7M]

**UNIT – V**

9. a) Explain how arrays are passed as function arguments. Write a C program to add two 2-dimensional arrays using the concept of arrays as function arguments. [7M]
- b) Explain the following with example: (i) fprintf( ) (ii) fscanf( ) (iii) fgets( ) [7M]  
(iv) feof( ) (v) rewind( ) (vi) fseek( ) (vii) ftell( )
- (OR)**
- 10 a) Write a C program to count number of lines, words and characters in a given text file. [7M]
- b) Explain about calling function, called function and actual and formal arguments with suitable examples. [7M]

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**UNIT - I**

1. a) Explain the following storage classes with example: [7M]  
(i) auto storage class  
(ii) static storage class  
(iii) extern storage class  
(iv) register storage class
- b) What is associativity? Explain operator precedence. [7M]

**(OR)**

2. a) How to store real numbers in computer system? Demonstrate and explain the role of normalization, sign, exponent and mantissa in storing and retrieving of real numbers. [7M]
- b) Explain the terms variables and constants. How many types of variables supported by C? Illustrate with a sample program. [7M]

**UNIT - II**

3. a) Write a C program to check whether the given integer number is palindrome or not. [7M]
- b) Explain different bitwise operators available in C with examples. [7M]

**(OR)**

4. a) Write a C program to find the roots of a quadratic equation  $ax^2 + bx + c = 0$  for all possible combination values of a, b and c. [7M]
- b) Explain various iterative statements available in C language with examples. [7M]

**UNIT - III**

5. a) What is a self-referential structure? Is it possible to nest the structure? Explain with example. [7M]
- b) Write a C program to multiply two 2-dimensional arrays. [7M]

**(OR)**

6. a) Define a structure. Describe how to declare and initialize structure and its members with an example. [7M]
- b) Write C program to concatenate two strings without using strcat( ) function. [7M]

**UNIT - IV**

7. a) What is a pointer? Explain declaration, initialization and accessing of a pointer Variable. [7M]
- b) What is address arithmetic in C? Explain different arithmetic operations that can be performed on pointers. [7M]

**(OR)**

8. a) How are generic pointers different from pointer variables and also differentiate ptr++ and ++ptr. [7M]  
b) Give the syntax and explain arrays of pointers in detail. [7M]

**UNIT – V**

9. a) What is mean by recursion? Explain the purpose of recursive function with an example. [7M]  
b) Write a C program to read and display the contents of a file. [7M]

**(OR)**

- 10 a) Write a program to demonstrate passing an array argument to a function. Consider the problem of finding largest of N numbers defined in an array. [7M]  
b) Explain about the fopen, fclose, feof, fprintf, fscanf, fseek and rewind functions. [7M]

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