

END SEMESTER EXAMINATION : MAY, 2025

INTRODUCTION TO COMPUTERS AND PROGRAMMING IN C

Time : 3 Hrs.

Maximum Marks : 60

Note: Attempt questions from all sections as directed.

Use of a simple, non-programmable calculator is allowed.

SECTION - A (24 Marks)

Attempt any four questions out of five.

Each question carries 06 marks.

1. Discuss the storage mechanism of computer system based on memory hierarchy pyramid. Also mention the characteristics of memories and their relationship with hierarchy pyramid. Justify the need for each memory storage.

2. Elaborate the characteristics of variable and what is meant by "value" of variable? How do variables and keywords differ from each other? Also mention the concept of type casting and type conversion emphasizing their utility with the help of example.

3. Write short notes on the following :

- Nested if...else statement.
- Use of break and continue statement

4. Emphasize the importance of functions in C. Also elaborate the difference between call by value and call by reference with the help of appropriate programming examples.

5. Elaborate the concept of Pointers in C. Also, write a program to swap two elements using pointer.

SECTION - B (20 Marks)

Attempt any two questions out of three.

Each question carries 10 marks.

6. (a) Evaluate the following :

$$(i) (101101.11)_2 = (?)_{10}$$

$$(ii) (1010101)_2 = (?)_8$$

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$$(iii) (4572)_8 = (?)_{16}$$

(iv) Binary multiplication of $(1101101) * (10010)$

$$(v) (1426)_8 = (?)_{10}$$

$$(vi) 101100011 + 110101$$

(6)

(b) Write a C program to search for an element in array using linear search algorithm. If the element is found than print the message “Element ‘x’ is fount at position ‘j’ in array”. If the element is not found than the message “Element ‘x’ is not present in list” should be displayed. (4)

7. (a) What will be the output of the following program, and explain how? (4)

```
#include <stdio.h>
int main ()
{
    int y, num=15;
    y = (num>10? (num <= 25? 50:100): 200);
    printf("%d\n", num);
    return 0;
}
```

(b) Write a C program to print all the Krishnamurty numbers from 1 to n, here, n is user dependant. A Krishnamurty number is a number whose sum of factorial of individual digits equals the number. For example, $40585 = 4! + 0! + 5!$

$$+8! +5! = 24 + 1 + 120 + 40320 + 120 = 40585 \quad (6)$$

8. (a) Provide a C program to determine and print the sum of the following series for a given value of n terms :

$$-1^3 + 3^3 - 5^3 + 7^3 - 9^3 + 11^3 - \dots \text{ upto } n \text{ terms.}$$

The value of n should be given interactively through the terminal. (5)

(b) Define a structure called "cricket" that will describe the following information:

- Player Name
- Team name
- Batting Average

Using "cricket", declare an array of structure "player" with 50 elements and write a program to read the information about the 50 players and print a team-wise list containing names of players with their batting average. (5)

SECTION - C **(16 Marks)**
(Compulsory)

9. (a) Write a menu-driven program (using switch case) that has the following options : (4)

- Fibonacci series up to mentioned number of terms
- Palindrome or not
- Exit

(b) Two matrices that have the same number of rows and columns can be multiplied to produce a third matrix.

The product of A and B is a third matrix C of size ($n \times n$). Write a program that will read the values of elements of A and B and produce the product matrix C. (6)

(c) In a class of 50 students, there are three major subjects- Economics, Mathematics and English. The faculty has evaluated the result and stored in

a text file named “ECO.txt”, “Math.txt” and “ENG.txt”, respectively. Develop a C program to publish the results in another text file named “STU_RES.txt”, it will contain the percentage marks obtained by summing the marks of subjects.

(6)