Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 60289

M.C.A. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

Elective

(Bridge Course)

BX 4002 – PROBLEM SOLVING AND PROGRAMMING IN C

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the idea behind divide and conquer design strategy in developing software.

2. How are loops terminated in a programming language?

3. Write a pseudocode to count the number of digits in an integer.

4. List the differences between a compiler and an interpreter.

5. Give the precedence and associativity of arithmetic operators in C.

6. Write a code snippet to check if the number is prime or not.

7. Compare iteration and recursion using an example.

8. How can a 2D array be created dynamically in C language?

9. What is an enumerated data type? Give an example.

10. Write a note on command line arguments.

PART B — (5 × 13 = 65 marks)

11. (a) (i) Explain bow algorithms designed in top down fashion is implemented using suitable examples. (7)

(ii) Discuss about the use of procedures in writing computer programs. (6)

Or

(b) (i) What is meant by program verification? Explain verification of program segments with loops and segments that employ arrays. (7)

(ii) Explain proof for termination with examples. (6)

12. (a) (i) Write an algorithm to find the factorial of a number. Also represent the same using a flowchart. (7)

(ii) Elaborate on the functions of loaders and linkers. (6)

Or

(b) (i) Explain the building blocks of a programming language with examples. (7)

(ii) Write an algorithm to test if the given number is Armstrong or not. Write few test cases. (6)

13. (a) (i) Explain the use of selection statements used in C language with suitable examples. (7)

(ii) Write a C program to sort ten numbers using nested loops. (6)

Or

(b) (i) Explain anyone iterative constructs of C programming language with examples. (7)

(ii) Write a C program to reverse the digits in a number. (6)

14. (a) Elaborate on the use of one dimensional and 2D arrays with their syntax and examples.

Or

(b) (i) Explain about the four storage classes used in C programming language. (6)

(ii) Write a program to concatenate two strings without using built-in functions. (7)

15. (a) (i) Explain user defined data types with an example. (6)

(ii) Write a C program to store student records as structures and sort them by name. (7)

Or

(b) (i) Explain any two types of files supported by C language. (6)

(ii) Write a C program to create a file and write some lines of English words in it. Use necessary operations in C to compute the number of words present in the file and display. (7)

PART C — (1 × 15 = 15 marks)

16. (a) (i) Write an algorithm to perform linear search. Find out its best. worst and average case time complexities. (8)

(ii) Write a recursive function to compute the nth Fibonacci number. (7)

Or

(b) (i) Write a C program to find the sum of non-diagonal elements of a square matrix. (7)

(ii) Write a C program to reverse the words in a sentence and display them. (8)
