

**MCA (Revised) / BCA (Revised)**

**Term-End Examination**

**June, 2021**

**MCS-011 : PROBLEM SOLVING AND  
PROGRAMMING**

*Time : 3 hours*

*Maximum Marks : 100*

*(Weightage : 75%)*

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**Note :** *Question no. 1 is compulsory. Answer any three questions from the rest.*

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1. (a) Write an algorithm and draw a corresponding flow chart to check whether the given year is a leap year or not. 10
  
- (b) Write a C function **isodd(num)** that accepts an integer argument and returns 1 if the argument is odd and 0 otherwise. 4
  
- (c) Write a C program that invokes this function to generate numbers between the given range. 6

- (d) Define an Array. How do we declare and initialize a single-dimensional array and a 2-dimensional array ? Explain with an example for each. 4
- (e) Write a C program to implement STRING COPY operation that copies a string “**str1**” to another string “**str2**” without using library function. 8
- (f) Write a C program to maintain a record of “n” student details using an array of structures with structure variables (Rollnumber, Name, Marks1, Marks2, Marks3, Marks4 and Grade). Define each field of the structure with appropriate datatype. Print the marks of the student of given Rollnumber as input. 8
2. (a) Discuss dynamic memory allocation in C. Write and explain dynamic allocation functions in C. 6
- (b) Write and explain any two pre-processor directives in C. 4
- (c) Write a C program to find the sum of diagonal elements of a  $3 \times 3$  matrix. 10
3. (a) Write a C program to create a file of numbers given by the user and copy odd numbers to odd.dat file and even numbers to even.dat file. 10
- (b) *Using recursion*, write a C program to find the factorial of a given number. 10

4. (a) Write a function to print the sum of the following series :

$$1 + 2^2 + 3^3 + \dots + n^n$$

where “n” is passed as an argument to the function.

8

- (b) Write a program to calculate the number of vowels (a, e, i, o, u) separately in the entered string and display their individual count.

12

5. (a) Write two differences between a structure and a union with appropriate examples.

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- (b) Write a C program to find the substring in a string without using a library function.

10

- (c) Write a program to delete an element from a given location of an array of integers.

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