

**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. 4

- (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. 6

