

**PG CBCS**  
**M.Sc. Semester-I Examination, 2020**  
**MATHEMATICS**  
**PAPER: MTM 104**  
**(ADVANCE PROGRAMMING IN C AND MATLAB)**

**Full Marks: 40****Time: 2 Hours****Answer any four questions:****10X4=40**

1. Write a M-file to find the prime factors of a positive integer. What is meant by dynamic memory allocation? Explain the difference among malloc(), calloc(), realloc() in terms of the functions they perform. 5+2+3
2. What is the difference between text file and binary file? Write a program in C to read all numbers from an input file and to store the average of these numbers in an output file. Describe the loop control statements in MATLAB with examples. 2+3+5
3. Write a program in MATLAB to find the median of a set of data using a function. Explain fprintf function in MATLAB with different format specifiers. 5+5
4. How transpose, determinant and inverse of a matrix can be done using MATLAB? Explain with examples. Write a program in C to count the number of vowels, consonants and space in a line. 5+5
5. Write down a program in C for sorting some strings, then use it to display the sorted string using dynamic memory allocation in the main function. 5+5
6. Write a program in C to find the product of two complex numbers defining a complex number using structure. Explain the relational and logical operations in MATLAB with examples. 5+5
7. Write a program in C to convert the content of a text file to uppercase. Explain different types of bitwise operators in C. 5+5
8. What is cell array in MATLAB? How a cell array can be created? Illustrate with examples. What is structure in MATLAB? Discuss the ways to create a structure with examples. How can a cell array be converted into structure and vice-versa. 2+3+2+3

**[Internal Assessment-10]**