

M.Sc. 1st Semester Examination, 2014

**APPLIED MATHEMATICS WITH OCEANOLOGY
AND COMPUTER PROGRAMMING**

(Advanced Programming in C and MATLAB)

PAPER— MTM - 104

Full Marks : 50

Time : 2 hours

The figures in the right-hand margin indicate marks

1. Answer any *five* questions : 1 × 5
- (i) How can you access a particular row or column of a matrix by a single statement in MATLAB?
 - (ii) How will you convert an octal number into binary number in MATLAB?
 - (iii) What is Regular array in MATLAB?

(Turn Over)

(2)

- (iv) What are the functions of TIC and TOC in MATLAB ?
- (v) How a pointer variable is declared ?
- (vi) How can an individual structure member be accessed in terms of its corresponding pointer variable ?
- (vii) What is the relationship between a stream pointer and a buffer area ?
- (viii) Express the following in MATLAB

$$\frac{(-1)^n x^{n+3m}}{m!(m+n)!}$$

2. Answer any *seven* questions : 5 × 7

- (i) Explain *fprintf* function in MATLAB with different format specifiers by examples.
- (ii) Write a program in MATLAB to find the median of a set of data using a function.

- (iii) Describe the loop control statements in MATLAB with example.
- (iv) How transpose, determinant and inverse of a matrix can be done using MATLAB ? Explain with examples.
- (v) What is a self-referential structure ? For what kinds of applications is it useful ? Write a program in C to find the product of two complex numbers defining a structure of complex number.
- (vi) What is meant by dynamic memory allocation ? Explain the difference among *malloc()*, *calloc()* and *realloc()* in terms of the functions they perform.
- (vii) Write a program in C to count the number of vowels, consonants and space in a line using *enum*.
- (viii) What is the difference between text file and binary file ? Write a program in C to read

(4)

all numbers from an input file and to store the average of these numbers in an output file.

- (ix) What is the purpose of the *register* storage class? What types of variables can be assigned to this storage class? What is meant by bitwise operations? Explain any one of bitwise operators.
- (x) Write a M-file to find the prime factors of a positive integer.

[*Internal Assessment* : 10 Marks]