2018

M.Sc.

4th Semester Examination

APPLIED MATHEMATICS WITH OCEANOLOGY AND COMPUTER PROGRAMMING

PAPER—MTM-402 (Unit-II)

Subject Code—21

Full Marks : 25

Time : 1 Hour

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

(*Stochastic Process and Regression*)

Answer Q. No. *1* and any *two* from the rest.

1. Answer any *two* questions : 2×2

   (a) Define Markov chain with example. Also, define its order.

   (b) Define multiple correlation and partial correlation, and indicate how they differ from simple correlation.

(c) Define the following states : periodic, closed, persistent and transient.

2. Obtain the multiple regression equation of x_1 on x_2, x_3, ..., x_p in terms of the means, the standard deviations and the inter correlations of the variables.   8

3. (a) Write transition matrix for the problem of random walk between reflecting barriers.

   (b) State and prove Chapman-Kolmogorov equation.

   (c) Prove that the state j is persistent iff

$$\sum_{n=0}^{\infty} p_{jj}^{(n)} = \infty .$$
    2+3+3

4. (a) Deduce the forward diffusion equation for the Wiener process.

   (b) Describe Gauss-Markov model for linear estimation.
    4+4

[Internal Assessment : 05 Marks]

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