

M.Sc. - II (Mathematics) (NEP Pattern) Semester-IV
04NEPMATH03 - Major : Mathematical Modelling

P. Pages : 2

Time : Three Hours



GUG/S/25/16360

Max. Marks : 80

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- Notes : 1. Solve all **five** questions.
2. All questions carry equal marks.

UNIT – I

1. a) Explain twelve-point procedure for solving the problem through mathematical modelling. **8**
b) Write a note on classification of mathematical models. **8**

OR

- c) Find the distance of moon through application of trigonometry in mathematical modelling. **8**
d) Discuss the limitations of mathematical modelling. **8**

UNIT – II

2. a) Write a note on mathematical model on laws of mass action in chemical reactions. **8**
b) How compound interest can be computed by mathematical modeling. **8**

OR

- c) Develop a mathematical model for the motion of rocket neglecting both gravity, and air resistance. **8**
d) Write a note on the diffusion model of glucose blood stream. **8**

UNIT – III

3. a) Write a note on competitions models. **8**
b) Explain simple epidemic model. **8**

OR

- c) Explain the Leontief's open and closed dynamical systems for the inter-industry relations. **8**
d) Write a note on Lanchester's combat model. **8**

UNIT – IV

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| 4. | a) | Discuss the Samuelson's interaction model. | 8 |
| | b) | Explain the complementary function for the linear difference equations with constant coefficients. | 8 |

OR

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| c) | | Discuss the age-structured population models. | 8 |
| d) | | Write a note on mathematical model for Markov chains. | 8 |
| 5. | a) | Explain methods for estimating the height of mountain peaks and depth of the ocean beds. | 4 |
| | b) | Write a short note on mathematical model to study diffusion of solute across a thin membrane. | 4 |
| | c) | Discuss simple epidemic model with carriers. | 4 |
| | d) | Find the solution of linear difference equations by using Laplace Transform. | 4 |
