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UNIVERSITY

Indira Gandhi National Open University
School of Sciences

MST-001
Foundation in
Mathematics and
Statistics

Block

3

**MATRICES, DETERMINANTS AND
COLLECTION OF DATA**

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Acknowledgement: We gratefully acknowledge Prof. Geeta Kaicker, Director, School of Sciences and Prof. Parvin Sinclair, Director, NCERT for reading the course material and providing their valuable suggestions to improve the Course.

March, 2012

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ISBN – 978-81-266-5973-9

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Further information on the Indira Gandhi National Open University courses may be obtained from the University's office at Maidan Garhi, New Delhi-110 068.

Printed and published on behalf of the Indira Gandhi National Open University, New Delhi by Director, School of Sciences.

Printed at: Gita Offset Printers Pvt. Ltd., C-90, Okhla Indl. Area-I, New Delhi-20

BLOCK 3 MATRICES, DETERMINANTS AND COLLECTION OF DATA

This is the third block of the course MST-001. This block is devoted to matrices, determinants, and introduction to statistics, collection and scrutiny of data. The aim of units 9 and 10 is just to give you an idea of matrices and determinants as the concepts related to these terms will be used in some sections of some courses. Last two units of this block and all the four units of the next block of this course put a foundation stone to the statistics.

Unit 9: Matrices and Determinants

This unit discusses what we mean by matrices and its different types, operation on matrices and trace of a square matrix. Concept of determinants and how we evaluate the determinants of square matrices of orders 1, 2, 3 and higher orders have been also discussed. This unit ends by giving some properties of determinants and how these properties are used, is explained with the help of some examples.

Unit 10: Applications of Matrices and Determinants

In this unit adjoint and inverse of a square matrix are discussed. Applications of matrices and determinants in solving a system of linear equations by matrix method and Cramer's rule have been also discussed.

Unit 11: Introduction to Statistics

This unit throws the light on origin and development, definition, scope and uses, and limitations of statistics. Different types of measurement of scale have been discussed in detail. Time series, cross section, discrete, continuous, frequency and non frequency data have been also discussed.

Unit 12: Collection and Scrutiny of Data

In this unit main methods of collection of primary data are discussed. Sources of collection of secondary data including some government publications, scrutiny of data and preparation of different kinds of questionnaires have been also discussed.

Notations and Symbols

$[a_{ij}]_{m \times n}$: matrix of order $m \times n$ with $(i, j)^{\text{th}}$ element as a_{ij}
 A' : transpose of matrix A
 $\text{tr}(A)$: trace of matrix A

$|A|$: determinant of the square matrix A

M_{ij} : minor of $(i, j)^{\text{th}}$ element of the matrix $[a_{ij}]$

A_{ij} : cofactor of $(i, j)^{\text{th}}$ element of the matrix $[a_{ij}]$

$\text{adj}A$: adjoint of A

A^{-1} : inverse of matrix A

Δ : capital delta