Four Year Under Graduate Programme (FYUGP)

As per provisions of NEP-2020

Vinoba Bhave University Hazaribag

Mathematical and Computational Thinking and Analysis

Subject Code: CC-5

To be implemented from the Academic Year **2022-23**

(From session 2022-26)

Syllabus for Semester -II

Semester	Subject name	Subject Code	Credit	Teaching hours
II	**Mathematical and computational Thinking and Analysis**	**CC-5**	2	30

Instructions to question setters;

All together there will be 25 MCQs each of three marks from the units as instructed. Students are required to answer all questions on OMR sheet.

Course Learning Outcomes: This course will enable the students to:

a) Understand the notions of logic and Mathematical Induction.
b) Basic concepts of sets.
c) Analytic approach toward the solution of algebraic equations.
d) Connections of roots and coefficients.
e) Understand basic concept of Probability and statistics.
f) Understand and analyze the coordinate systems.

Full marks-Mid semester 25 marks + end semester 75 marks (Total 100 marks)

UNIT-1: Logic: statement, truth table, quantifiers, connectives and tautology, Mathematical induction.

[5 Questions]

UNIT-2: Sets and Number System: operations on sets, Elementary Properties, Decimal system, binary decimal, octal system, hexadecimal system, arithmetic, conversion from binary to decimal and decimal to binary.

[5 Questions]

UNIT-3: Theory of Equation: Relation between roots and coefficients, Transformation of equation, Symmetric functions of roots, Solutions of cubic and biquadratic equations.

[5 Questions]

UNIT-4: Statistics and Probability: Data collection and presentation using bar chart, column chart, line chart, pie chart, scatter chart, surface chart. Calculation of frequency. Measure of central tendency, Mean, Median and Mode, Definition ofProbability, Elementary properties, addition theorem, multiplication theorem, independent events.

[6 Questions]

UNIT-5: Geometry: Cartesian, spherical polar and Spherical cylindrical coordinate systems; their interrelationship.

[4 Questions]

Suggested reading:

1. An introduction to the theory of Numbers, 4th Ed., G. H. HARDY AND E. M. WRIGHT, 1975, Oxford university Press.
2. An Introduction to The Modern Theory of Equations, Florian Cajori, The Macmillan Company ' London: Macmhian & Co., Ltd., 1904.
3. N. K. Singh, A text book of Probability and Statistics, 1st Edition, Pragati Publication, Meerut.
4. Probability and Statistics (4th Edition) 4th Edition,Morris H. DeGroot (Author), Mark J. Schervish, Pearsion Education limited 2014.
5.N. K. Singh, Theory of Equations, 1st Edition, Pragati Publication, Meerut.
6. R.G. Bartle and D. R. Sherbert, Introduction to Real Analysis(3rd Edition), John Wiley and Sons (Asia) Pvt. Ltd., Singapore,2002.
7. Discrete Mathematical Structure, 4th Ed., Kolman, Busby and Ross, Pearson Education Asia, 2002.