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Semester wise Syllabus of Multi Disciplinary Courses in Mathematics:

First Year, Semester – 1, Course: MDC – 1
Paper Name: Business Mathematics
Paper Code:
Full Marks: 50 (35 = Written, 10 = Internal, 5 = Attendance)

Total Credit: 3, Total Hours: 40

Program Objectives:
The objective of this course is to:
  ➢ familiarize the students with the basic mathematical tools, with an emphasis on applications to business and economics,
  ➢ translate the real word problems through appropriate mathematical modelling,
  ➢ explain the concepts and use of the mathematical equations, formulae and mathematical expression and relationship in a variety of context,
  ➢ find the extreme values of functions,
  ➢ analyze and demonstrate the mathematical skills in the areas of economics and business.

Program Outcomes:
This course will enable the students to:
  ➢ explain the concepts and use of the mathematical equations, formulae and mathematical expressions and relationship in a variety of context,
  ➢ find the extreme values of various functions,
  ➢ analyze and demonstrate the mathematical skill require in mathematically intensive areas in economics and business.

Unit-1: Matrices and Determinants
Definition of a matrix, Types of matrices, Algebra of matrices, Properties of determinants, Calculations of values of determinants up to third order, Inverse of a matrix, Elementary row and column operations, Solution of system of linear equations having unique solution and involving not more than three variables (using Matrix Inversion Method and Cremer's Rule), Examples on commercial mathematics.

(8 Hours)

Unit-2: Calculus
Concepts of limit and continuity of a function, Concept, rules and methods of differentiation and its calculation up to second order derivatives, Maxima and Minima of a function and its application, Partial Differentiation: Partial derivatives up to second

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order, Homogeneity of functions and Euler's theorem, Total differentials, Differentiation of implicit functions with the help of total differentials. Integration: Standard forms, Methods of Integration- by substitutions, by pats and by use of partial fractions, definite integration, finding areas in simple cases.

(8 Hours)

Unit-3: Percentage, Ratios and Proportions

Percentages: Definition, Calculation of percentage, Ratios: Types of Ratios, Duplicate Triplicate and Sub-Duplicate of ratio, Proportions: Definitions and properties- cross product property and reciprocal property, continued proportions, Compound proportions, Examples on commercial mathematics.

(12 Hours)

Unit-4: Mathematics of Finance:

Rates of Interest: nominal, effective; and their inter-relationships in different compounding situations, Compounding and discounting of a sum using different types of rates, Types of annuities, like ordinary, due, deferred, continuous, perpetual, and their future and present values using different types of rates of interest, Depreciation of Assets (General annuities to be excluded).

(12 Hours)

Reference Books:

1. Basic Mathematics, R.G.D. Allen, Macmillan, New Delhi, 1962
2. Mathematical Analysis for Economists, R.G.D. Allen, Macmillan
3. Quantitative Techniques in Management, N.D. Vohra, Tata McGraw Hill, New Delhi, 2006
4. Business Mathematics with Applications in Business and Economics, R.S. Soni, Pitambar Publishing House, Delhi, 1996
5. Introduction to Mathematical Economics, E.T. Dowling, Schaum's Series, McGraw Hill.

COOCH BEHAR PANCHANAN BARMA UNIVERSITY

PANCHANAN NAGAR, VIVEKANANDA STREET, COOCH BEHAR – 736101

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Second Year, Semester – 3, Course: MDC – 2
Paper Name: Mathematical Reasoning – 1
Paper Code:
Full Marks: 50 (35 = Written, 10 = Internal, 5 = Attendance)

Total Credit: 3, Total Hours: 40

Programme Objectives:
Reasoning skills help the students to improve their decision-making skills, problem-solving skills and setting goals. These personal skills are necessary for building a stable career foundation. Most of the companies conduct a Logic Building Analysis round while organizing their recruitment drive, to check the mental ability of the candidates. The course aims to make the students to understand the fundamental logical reasoning and help them to prepare for competitive examinations.

Programme Outcomes:
On successful completion of the course, the students will be able to:
➢ understand the basic concepts of quantitative ability,
➢ understand the basic concepts of logical reasoning Skills,
➢ acquire satisfactory competency in use of reasoning,
➢ use their logical thinking to solve Quantitative Aptitude problems from company specific and other competitive tests.

Unit-1: (15 Hours)
Series completion: Number series, alphabet series, alpha-numeric series, continuous power series; Coding-Decoding: letter coding, number coding, matrix coding, jumbled coding.

Unit-2: (15 Hours)
Puzzle test: classification, seating/placing arrangements, comparisons, sequential order of things, selection based on a given conditions, family-based puzzles, jumbled problems; Logical Venn diagrams, alphabet test, Alpha numeric sequence puzzle, Number, ranking and time sequence test.

Unit-3: (10 Hours)
Mathematical operations, arithmetical reasoning, data sufficiency, eligibility test, assertion and reason, situation reaction test.

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Reference Books:

1. A Modern Approach To Verbal & Non Verbal Reasoning, R. S. Agarwal, S. Chand.
2. Analytical and Logical reasoning, B. S. Sijwali, Arihant.
3. Quantitative aptitude for Competitive examinations, R. S. Agarwal, S.Chand.
4. Quantitative Aptitudefor Competitive Examinations, Abhijit Guha, McGraw Hill.

**Third Year, Semester – 5, Course: MDC – 3
Paper Name: Mathematical Reasoning – 2
Paper Code:
Full Marks: 50 (35 = Written, 10 = Internal, 5 = Attendance)**

Total Credit: 3, Total Hours: 40

Programme Objectives:

The objectives of this course are to:
➢ develop the analytical and logical reasoning skills,
➢ help the students to improve their decision-making and problem-solving skills,
➢ make the students be well prepared for competitive examinations.

Programme Outcomes:

This course will enable the students to:
➢ understand the basic concepts of quantitative ability, analytical and logical reasoning,
➢ develop a confident mind for different competitive examinations.

Unit-1: (15 Hours)

Analytical reasoning, Analogy: choosing the odd relationship, choosing one element of a similarly related pair, detecting the relationship and choosing the correct substitute, classification: finding figures with same characteristics.

Unit-2: (15 Hours)

Logical reasoning, logical deduction: two and three premise arguments, Statement of Arguments, Statement of Assumptions, Statement of Conclusions.

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Unit-3:   **(10 Hours)**
Series: Three, Four and Five figure series, Choosing the missing figure in a series, Detecting the incorrect order in a series, Detecting the wrong figure in a series.

Reference Books:
1. A Modern Approach To Verbal & Non Verbal Reasoning, R. S. Agarwal, S. Chand.
2. Analytical and Logical reasoning, B. S. Sijwali, Arihant.
3. Quantitative aptitude for Competitive examinations, R. S. Agarwal, S. Chand.
4. Quantitative Aptitude for Competitive Examinations, Abhijit Guha, McGraw Hill.