

**FIRST YEAR B. B. A.
PAPER - 4 BUSINESS MATHEMATICS**

(Effective from June 1999)

- I. Set Theory :** **10%**
Sets, types of sets, subset, power set, null set, universal set, equality of two sets, complement of a set, union and intersection of sets, different of two sets, Venn diagram law of algebra of sets, De Morgan Laws, Cartesian product of two sets and number of elements in a finite set.
- II. Real Number System :** **4%**
Definition of Natural numbers, Integers, Relation numbers & irrational numbers, Real numbers- absolute value and its properties.
- III. Permutations and Combination :** **8%**
Basic ideas of permutation and combination, illustration of these concepts for different and like things, circular permutation, explanations and relation between nPr , nCr and establishment of simple relations like
 ${}^nC_r + {}^nC_{r-1} = {}^{n+1}C_r$, $r({}^nC_r) = n({}^{n-1}C_{r-1})$.
- IV. Matrix Algebra :** **14%**
Meaning of matrix and types of matrices- Null matrix, square matrix. identity matrix, symmetric matrix and skew symmetric matrix, transpose of a matrix, orthogonal matrix, addition, subtraction and multiplication of matrices, determinants and their basic properties (without proof), singular and non singular matrices, inverse of a matrix, ad joint of a matrix, solution of simultaneous equations (for two and three variables only) using inverse of matrix.
- V. Co-ordinate Geometry :** **14%**
Co-ordinate of points, slope and intercepts of a straight line, equation of a straight line, different forms of equations of a straight line - (1) $\frac{y-y_1}{y_1-y_2} = \frac{x-x_1}{x_1-x_2}$. (2) $y-y_1=m(x-x_1)$. (3) $y=mx + c$ (4) $\frac{x}{a} + \frac{y}{b} = 1$.
General equation of a straight line, concurrent lines, angle between two straight lines, distance between two points area of a triangle and quadrilateral, collinearly of three points.
- VI. Function :** **6%**
Concepts of a function, domain, co-domain and range of a function, constant functions, real functions, different functions and their graphs - linear function, quadratic function, polynomial function, rational function, exponential function and logarithmic function, function in economic theory (demand, supply, consumption, revenue and cost function) equilibrium price.
- VII. Limit :** **8%**
Limit as a function, limit of sum, product and quotient of two functions and their uses in evaluating limits, use of the standard forms (without proof) : $\text{Lim } (1 + 1/n)^n$, $\text{Lim } (1 + n)^{1/n}$, $\text{Lim } a^x - 1/x$ and $\text{Lim } x^n - a^n/x - a$ $n \rightarrow 0$ $x \rightarrow 0$ $x \rightarrow a$
- VIII. Differentiation :** **10%**
Definition of derivatives of a function, derivatives of explicit, composite and implicit functions, derivatives of exponent ion and logarithmic function, rules of differentiation (without proof), logarithmic differentiation, higher order derivatives, maximal and minimum.
- IX. Integration :** **10%**
Definition of integration as a process revenue to differentiation, indefinite integrals, standard integrals basic rules of integration, integration by arts, integration by substitution, definite integral, simple properties of definite integrals (without proof), total revenue from marginal revenue and total cost from marginal cost.
- XI. Linear Programming, Transportation and Assignment Problems :** **16%**
Meaning of linear programming, formulation of LP Problem for two variables, solution of LP problems by graphical and simplex method, formulation of transportation problem its initial basic feasible solution by North-West Corner rule and optimum solution by modified distribution method, degeneracy and its resolution.
Assignment problem and its optimum solution by Hungarian method.

Book for Reference :

1. Business Mathematics by Sancheti and Kapoor (S. Chand Co.)
2. Mathematics for business and economics by J.D. Gupta, P.K. Gupta and man mohan.

HAMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

3. Operation research and statistical analysis By P. K. Gupta and man mohan (S.Chand.Co.)
4. Quantitative techniques in management by (Tata mc Ghpeul hill publishers co.Ltd.).
5. Elements of Business Mathematics by Soni, Sharma and Saxena (Pitamber Publication Co.)
6. Mathematics for Management by Bronson and Richard Bronson.