

Mathematics Syllabus – 10 Marks

Common to all Branches

(Except Architecture and Planning)

I. Matrices:

Solving system of equations – Matrices - Rank of a Matrix – Eigenvalues and Eigenvectors – Cayley-Hamilton theorem - Quadratic Form.

II. Differential Calculus:

Limit – Continuity – Intermediate Value theorem – Rolle's Theorem - Differentiability - Mean Value theorem - Partial derivatives – Differentiation of Implicit Functions - Jacobians – Taylor's Expansion – Maxima and Minima.

III. Multiple Integrals and Vector Calculus:

Double and triple integrals and their applications to Area and Volume Problems – Gradient, Divergence, Curl – Line, Surface and Volume Integrals - Green's, Gauss divergence and Stoke's theorem.

for Architecture

I. Trigonometry and Mensuration:

Trigonometric and exponential functions - De-Moivre's theorem. Mensuration - Area of plane figures - Computation of volume of solid figures.

II. Three Dimensional Analytic Geometry:

Direction cosines and ratios - Angle between two lines - Plane - Straight line - Sphere - Tangent plane - Plane section of a sphere.

III. Calculus:

Integral Calculus: Integration of rational, trigonometric and irrational functions - Properties of definite integrals - Reduction formulae for trigonometric functions. Functions of Several Variables: Taylor's Theorem - Maxima and Minima

IV. Statistics and Probability:

The arithmetic mean, median, mode, standard deviation and variance - Regression and correlation - Elementary probability - Laws of addition and multiplication of probabilities - Conditional probability - Independent events. Mathematics

for Planning

I INTRODUCTION TO STATISTICAL METHODS

Statistical Data- Types of Data: nominal, ordinal, interval and ratio; Discrete versus continuous data; Numerical data- properties and measures; Data collection, coding and decoding methods, tabulation and graphic representation of data; Frequency distribution; Measures of central tendencies: mean, median, mode; Measures of Dispersion: range, variance and standard deviation, skewed distribution, kurtosis;

II PROBABILITY, SAMPLING DISTRIBUTION AND TESTING OF HYPOTHESIS

Introduction to probability, Discrete random variables and probability distribution; Sampling distribution, Types of estimation; Point, interval, testing of hypothesis, statistical hypothesis, simple and composite tests of significance, null hypothesis, alternative hypothesis; Types of errors, level of significance.

III CORRELATION AND REGRESSION ANALYSIS

Degree of correlation, Scatter Diagram, correlation analysis, correlation co-efficient, co-efficient of rank correlation, partial correlation analysis and multiple correlation, simple Linear and nonlinear regression, lines of regression, coefficient of regression.
