

STATE COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

TNCF 2017 - DRAFT SYLLABUS

Subject :Business Maths

Class : XI

TOPIC	CONTENT
Unit 1 : Matrices and Determinants	Determinants - Minors; Cofactors; Evaluation of 2x2,3x3 determinants; properties of determinants (statement only); simple problems Inverse of a Matrix - Recalling operations on matrices; Singular and non-singular matrices; Ad joint of a matrix; Inverse of a matrix; System of equations with two and three variables; Problems. Input -Output Analysis - Input Output Analysis Problems
Unit 2 : Algebra	Partial fractions - Types: $\frac{P(x)}{Q(x)}$ where Q(x) consisting non repeated linear factors; Repeated linear factors and product of a linear factor; Non factoraizable quadratic factors Permutations - Definition; Principle of counting; Addition; multiplication; factorial; Applying permutation concept to solve problems; Computing circular permutations. Combinations - Definition; Pascal's Law and Pascal's triangle; Applications of formula derived above.

	<p>Mathematical induction - Explaining the principle of Mathematical Induction; Simple Problems.</p> <p>Binomial Theorem - Statement for positive integral index only; Expansion; Finding middle terms; Finding particular term; Simple problems; Binomial coefficients</p>
<p>Unit 3 : Analytical Geometry</p>	<p>Locus – Definition; Equation of locus</p> <p>System of Straight Lines - Simple problems; Angle between two lines; Concurrency of three lines; Condition for perpendicularity and parallelism.</p> <p>Pair of Straight Lines - General equation of pair of straight lines; Pair of straight lines passing through origin; Angle between pair of straight lines.</p> <p>Circles - Equation of circles with centre and radius; Equation of circle when extremities of diameter given; General equation of circle; Simple problems; Equation and length of the tangent.</p> <p>Conics and Parabola - Conics sections; Conic; Equation of parabola; Standard forms; Vertex, focus, directrix ,eccentricity and latus rectum; Simple problems.</p>
<p>Unit 4 : Trigonometry</p>	<p>Trigonometric ratios - Recall trigonometric ratios and identities; Signs of trigonometric ratios.</p> <p>Compound angles - Addition and Subtraction formulae (without proof); Multiple angles and sub</p>

	<p>multiple angles</p> <p>Product formulae - Transformation of products into sums or difference; Transformation of sums or differences into products</p> <p>Inverse Trigonometric functions - Important properties of inverse trigonometric functions; Simple Problems</p>
<p>Unit 5 : Differential Calculus</p>	<p>Functions and their graphs - Basic definition; Types of functions (except circular and inverse trigonometric functions) Cost Function; Price Demand Function; Revenue Function; Profit function; Applications; Quadratic functions; Polynomial function; Logarithmic function; Exponential function and their graphs</p> <p>Limits and Derivatives - Standard limits (statement only); Simple problems; Definition of derivatives, derivative of $x^n, e^x, \log_e x$; Using first principle; Simple problems</p> <p>Differentiation technique - Constant multiple rule addition and subtraction rule, power rule, product rule, quotient rule, chain rule, implicit function, differentiating successively up to second order.</p>
<p>Unit 6 : Applications of Differentiation</p>	<p>Applications in business and economics - Demand, supply , cost , revenue and profit function; Elasticity; Marginal analysis</p> <p>Maxima and Minima - Solving problems related to increasing decreasing functions; Stationary values;</p>

	<p>Local and global maxima and minima.</p> <p>Application of Maxima and Minima - Solving problems on Profit Maximization , Inventory control and Economics order quantity; EOQ</p> <p>Partial Derivatives - Handling functions of 2 variables. Using Euler's theorem (without proof)</p> <p>Application of Partial Derivatives - Production function of two variables, marginal productivities of labor and capital, Partial elasticity's of demand.</p>
<p>Unit 7 : Financial Mathematics</p>	<p>Annuities - Annuity due, ordinary annuity and present value; Simple problems</p> <p>stocks and Brokerage – Definition; Concepts of income on a stock; Concept of gain or loss in the sale and purchase of a stock; Brokerage in share transactions.</p> <p>Shares and Debentures - Concepts and applications; Finding effective rate of return</p>
<p>Unit 8 : Descriptive Statistics</p>	<p>Measures of Central tendency and Measures of Dispersion – A.M, G.M, H.M; Their relations; Simple problems; Quartiles , deciles, percentiles; Quartile deviation; Mean deviation about mean , median and its relative measures</p> <p>Probability – Basic concepts of dependent and independent event; Conditional probability, multiplication theorems; Simple problems; Baye's theorem(Statement only) and its applications</p>

<p>Unit 9 :</p> <p>Correlation and regression analysis</p>	<p>Correlation – Concept; Types of correlation; Applications</p> <p>Rank Correlation – Concept and Simple problem (without tie)</p> <p>Regression equations – Concepts of independent and dependent variables; Regression; Regression equation of (i) Y on X (ii)X on Y(Only Concepts no derivations)</p>
<p>Unit 10 :</p> <p>Operation Research</p>	<p>Linear Programming - Basic concepts; Formulation of the Linear Programming Problem; Graphical method.</p> <p>Network Analysis - Basic concepts; Construction; Time and Critical path calculations.</p>

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TOPIC	CONTENT
Unit 1 : Application of Matrices and Determinants	Cramer's Rule - Statement ; Solving non homogeneous linear equations up to 3 Variables Rank of a Matrix - Concept; Elementary transformations; Finding the ranks up to 3 x 4 Matrices; Testing the consistency of non homogeneous linear equations (two and three variables) by rank method. Transition - Forecasting the succeeding state when the initial market share is given
Unit 2 : Integral Calculus - I	Concept of Integration - Defining and Identifying integral as anti derivative; Standard forms of integrals $\int \frac{dx}{Quadratic}$, $\int \frac{dx}{\sqrt{Quadratic}}$, $\int \sqrt{Quadratic}dx$; Simple problems; Integration by parts; Simple problems Definite Integral - The fundamental theorem of Integral calculus; Properties of Definite Integrals; Gamma Integral (Statement only); Simple Problems
Unit 3 : Integral Calculus - II	The Area of the region bounded by the curves - Geometrical interpretation of the definite integral as area under a curve Application of Integrals - Application of Integration in Economics and Commerce; Cost and Revenue

	functions; Consumer's Surplus; Producer's Surplus
Unit 4 : Differential Equations	<p>Formation of differential equation - Definition of differential equations; Order and degree; Formation of differential equation</p> <p>Solution of first order First degree Differential Equations – Solution; General solution; Particular integral. Solving variable separable ; Solving homogeneous equation; Solving linear equation; Business oriented problems</p> <p>Second Order linear differential equations with constant coefficient - $a \frac{d^2y}{dx^2} + b \frac{dy}{dx} + cy = \alpha e^{\lambda x}$ where α, λ are reals; Problems related to Business</p>
Unit 5 : Numerical Methods	<p>Finite differences - Difference Operators; Forward difference Operator, Backward difference Operator and shifting Operator; Finding missing terms; Simple problems</p> <p>Interpolations - Two methods in interpolation; Graphical method, Algebraic Method; Newton's forward and backward formulae and Lagrange's formula; Simple problems</p>
Unit 6 : Random Variables	<p>Random Variable – Definition; Discrete and Continuous; Probability function; Probability Mass function; Probability density function; Cumulative distribution function; Problems related to Business</p>

	<p>Mathematical Expectation - Mean, Variance; Definition; Properties of expectation and variance (without proof); Simple Problems</p>
<p>Unit 7 : Probability Distributions</p>	<p>Binomial Distribution – Definition; Mean; Variance; Problems</p> <p>Poisson Distribution – Definition; Examples; Mean; Variance; Problems</p> <p>Normal Distribution – Definition; Properties; Standard Normal Variate; Definitions; Problems</p>
<p>Unit 8 : Sampling techniques and Statistical Inference</p>	<p>Sampling Methods - Simple random sampling. Stratified Sampling, Systematic Sampling; Sampling and Non sampling errors</p> <p>Sampling Distributions - Definition of Sampling Distributions; Standard Error; Computing Standard error in simple cases.</p> <p>Hypothesis testing – Meaning; Null Hypothesis; Alternative hypothesis; Level of significance; Testing procedure; Large sample theory; Test of significance for single mean; Simple problems</p>
<p>Unit 9 : Statistical Methods</p>	<p>Time Series Analysis – Meaning; Uses; Basic Components; Estimating trends; Semi Average; Moving Average (three yearly, four yearly); Method of least squares; Seasonal Variation; Simple Problems</p> <p>Index Numbers – Meaning; Classifications; Uses; Weighted Averages; Laspyre’s; Paasche’s; Fisher’s</p>

	<p>ideal index numbers, time reversal and factor reversal test; Construction of cost of living index</p> <p>Statistical Quality control – Meaning; Causes for Variation; Assignable cause; Chance cause; Process control and product control; Simple problems</p>
<p>Unit 10 : Operations Research</p>	<p>Transportation Problem – Definition; Formulation; Methods of finding initial basic feasible solutions; North west corner rule, least cost method Vogel's approximation method</p> <p>Assignment Problems – Definition; Formulation; Solution of assignment problems</p> <p>Decision theory – Meaning; Situations; Certainty; Maximin and Minimax Strategy</p>