Maharashtra State Board of
Secondary & Higher Secondary School, Pune

Department of Mathematics

Subject: Mathematics & Statistics (88)
Standard: Twelve
Faculty: Commerce

Syllabus

XII Mathematics Paper-II (Theory & Practical)

Theory Index (Part II)

Sr. No.	Unit/Topic	Weightage
1	Commission, Brokerage and Discount	06
2	Insurance and Annuity	04
3	Linear regression	08
4	Time series	07
5	Index numbers	07
6	Linear programming	06
7	Assignment Problem and Sequencing	09
8	Probability distributions	11

Practical Index

Sr. No.	Practical's Name
1	Mathematical Logic
2	Finding Inverse of a Matrix
3	Solution of Linear Equations using Matrices
4	Commission, Brokerage, Discount
5	Insurance and Annuity
6	Fitting of Linear Regression
7	Applications of Linear Regression
8	Time Series
9	Index Numbers
10	Increasing and Decreasing Functions
11	Maxima and Minima
12	Applications of Derivatives to Economics
13	Linear Programming Problems
14	Assignment Problems
15	Sequencing
16	Random Variables
17	Binomial Distribution
18	Poisson Distribution
19	Applications of Definite Integration
20	Applications of Differential Equations

Syllabus (Part II)

Sr. No.	Name of the Topic	Scope of Syllabus
1	Commission, Brokerage and Discount	• Commission, Brokerage • Discount

2	Insurance and Annuity	• Fire, Marine and Accident Insurance
		• Annuity
		  ⇒ Terminology of Annuity
		  ⇒ Annuity Due
		  ⇒ Sinking Fund

3	Linear regression	• Meaning and Types of Regression
		• Fitting Simple Linear Regression
		  ⇒ Least Square Method
		  ⇒ Regression of Y on X
		  ⇒ Regression of X on Y
		• Properties of Regression Coefficients

4	Time series	• Uses of time series analysis.
		• Components of a time series.
		  ⇒ Secular Trend
		  ⇒ Seasonal Variation
		  ⇒ Cyclical Variation
		  ⇒ Irregular Variation
		• Mathematical Models
		  ⇒ Additive Model
		  ⇒ Multiplicative Model
		• Measurement of Secular Trend
		  ⇒ Graphical Method
		  ⇒ Method of Moving Averages
		  ⇒ Method of Least Squares

5	Index numbers	• Definition of Index Numbers
		• Types of Index Numbers
		• Terminology and Notation
		• Construction of Index Numbers
		  ⇒ Simple Aggregate Method
		  ⇒ Weighted Aggregate Method
		• Cost of Living Index Number
		  ⇒ Aggregative Expenditure Method
		  ⇒ Family Budget Method

		• Uses of Cost of Living Index Number
6	Linear programming	• Meaning of L.P.P. • Mathematical formula of L.P.P. $\Rightarrow$ Solution of L.P.P. by graphical Method
7	Assignment Problem and Sequencing	• Definition of Assignment Problem • Assignment model • Hungarian method of solving Assignment Problem • Special cases of Assignment Problem • Sequencing Problem • Types of Sequencing Problem • Finding an optimal sequence

8	Probability distributions	• Random variables
		• Types of random variables
		• Probability distribution of a random variable
		   $\Rightarrow$ Discrete random variable
		      • Probability mass function
		      • Cumulative distribution function
		      • Expected value and variance
		   $\Rightarrow$ Continuous random variable
		      • Probability density function
		      • Cumulative distribution function
		   $\Rightarrow$ Binomial distribution
		   $\Rightarrow$ Bernoulli trial
		• Mean and variance of Binomial distribution
		• Poisson distribution