

# Syllabus

## Class XII

### Sub : Statistics (Theory & Practical)

#### Half Yearly Exam : 2023-24

Theory Exam : Full Marks : 70, Time : 3 Hours

Mathematics : Limit, Continuity, Differentiation, Integration (only Numerical), Standard definition of Gamma integral 4 results involving it (without derivation).

Correlation & Regression : Bivariate Data, Scatter diagram, Correlation & Correlation coefficient, Properties of correlation coefficient, Rank correlation, spearman & Rank Correlation coefficient (without tie) .

Concept of Regression, Principle of least & squares, Fitting of Regression lines, Important results relating to regression lines.

#### Probability & Probability Distribution –I

Random experiment, Trial, Sample space, Sample point and different types of events, Definition of Probability : Classical, Statistical, and Axiomatic, Theorem on the probability of union of two or three events. Conditional Probability, Theorem on Conditional Probability for two or three events, Independent events, Bayes' theorem and its application. Random variable (discrete & continuous) and its probability distribution, cumulative distribution function. Probability mass function & Probability density function, Mathematical expectation. Addition and Multiplication rule of mathematical expectation. Problems related to probability distribution and Mathematical expectation.

#### Marks distribution for Half Yearly Exam :

Topic	1 Mark	2 Marks	3 Marks	5 Marks
Mathematics	2	1	1	1
Correlation & Regression	5	1	4	3
Probability & Probability Distribution	3	4	1	2
	<b>10</b>	<b>12</b>	<b>18</b>	<b>30</b>
<b>Total marks</b>				<b>70</b>

#### Practical Exam Syllabus for Half -Yearly Exam :

1. Correlation coefficient & linear regression
2. Spearman & Rank correlation coefficient (without tie)
3. Application & Fitting of Binomial distribution
4. Application & fitting of poisson distribution
5. Scatter diagram

## **Class -XII**

### **Sub: STATISTICS (Theory & Practical)**

## **Pre-Board / Board Final Examination, 2023-24**

Theory Examination, Full Marks: 70, Time: 3 Hours

**Mathematics:** Limit, Continuity, Differentiation, Integration (Only Numerical), **Standard** definition of Gamma integral and results involving it (without derivations).

### **Correlation & Regression**

Bivariate data. Scatter diagram. Correlation & Correlation coefficient. Properties of Correlation coefficient. Rank Correlation, Spearman's Rank Correlation coefficient (without tie).

Concept of Regression. Principle of Least squares. Fitting of Regression lines. Important results relating to regression lines.

### **Probability & Probability Distributions-I**

Random experiment, Trial, Sample space, Sample point and different types of events. Definition of Probability: Classical, Statistical and Axiomatic. Theorem on the probability of union of (two & three) events. Conditional probability. Theorem on conditional probability for two & three events. Independence of events. Bayes' theorem and its application.

Random variable (discrete and continuous) and its probability distribution. Cumulative distribution function. Probability mass function and Probability density function. Mathematical expectation. Addition and Multiplication rule of mathematical expectation. Problems related to probability distribution and mathematical expectation

### **Probability Distribution-II**

Uniform (Discrete and Continuous), Bernoulli, Binomial, Poisson, Geometric, Normal distribution and Exponential Distribution.

### **Sampling, Estimation & Testing of Hypotheses**

Population & sample. Parameter & statistic. Census & Sample survey. Concepts of probability sampling and random number tables. Concepts of sampling distribution of statistic and its standard error. Chi-square distribution, t-distribution, F-distribution (Definition and properties only). Simple random sampling with replacement (SRSWR) and Simple random sampling without replacement (SRSWOR): Estimation of population mean and standard error of the estimates.

Concept of Point estimation. Requirement of good estimator: Unbiasedness, Consistency, Efficiency. Elementary concept of MVUE & BLUE.

Statistical tests of Hypothesis- Null & alternative hypothesis. Simple & composite hypothesis, Critical region, Type-I and Type-II errors, Level of Significance and size of critical region, Power of a test. Tests of significance related to a single Binomial proportion, two binomial proportions using large sample approximations. Exact tests of hypothesis under normal set-up for a single mean and equality of two means. Frequency Chi-square test & Goodness of fit.

### **Marks Distribution for Pre-Board/Board Final Examination**

Topic	1 Mark	2 Marks	3 Marks	5 Marks
Mathematics	NIL	NIL	NIL	1
Correlation & Regression	2	NIL	1	1
Probability & Probability Distributions-I	5	2	2	1
Probability Distributions-II	NIL	2	2	1
Sampling, Estimation , Testing of Hypothesis	3	2	1	2
	10	12	18	30
Total marks	70			

### **Practical Examination syllabus of Pre-Board/Board Final Examination**

1. Scatter diagram.
2. Correlation coefficient and Linear Regression.
3. Spearman's Rank Correlation coefficient (without tie).
4. Applications and Fitting of Binomial Distributions.
5. Applications and Fitting of Poisson Distributions.
6. Applications and Fitting of Normal Distributions.
7. Drawing of random samples by using random number tables.
8. Calculation of sample mean and standard error of sample mean in case of SRSWR and SRSWOR
9. Large sample tests of a single mean, single proportion and difference of two proportions.
10. Pearson's Chi-square tests.
11. Exact tests of hypotheses under normal set-up for a single mean, difference of two means and single variance.

**Sub: Statistics**  
**Marks Distribution of Practical Examination**  
**(Half Yearly/Pre-board/Board Final Exam,2023-24)**

Full Marks: 30, Time: 3 Hours

1. Experiments (5 + 5 + 5+5)	20 Marks
2. Practical Note Book (PNB)	3 Marks
3. Viva-Voce	2 Marks
4. Attendance	5 Marks
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Total Marks :-	30 Marks