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FOR MANIPUR CLASS 12 PREPARATION

Manipur Board Class 12 Syllabus 2027 Statistics

EXAM	YEAR	TYPE	SUBJECT
Manipur Class 12	2027	Syllabus	Statistics

FOR THE ACADEMIC SESSION 2026-2027

STATISTICS

CLASS - XII

One Paper *Time : 3 Hours* *80 Marks*

Unit	Contents	Marks
1.	Probability and Expectation	15
2.	(i) Finite difference and Interpolation.	10
	(ii) Numerical Integration	10
3.	Standard Distributions.	10
4.	Theory of Attributes.	10
5.	Theory of Estimation and Testing of Hypothesis	15
6.	Vital Statistics.	10

Unit	Contents	Marks	Periods
1.	**Probability and Expectations :** Random Experiment, Trial, Event, Equally likely events, Mutually exclusive events, Favourable events and Exhaustive events, Independent and dependent events, Simple and Compound events. Sample space, Mathematical and Statistical definitions of probability, conditional probability, Additive and multiplicative laws of probability, Random Variable. Expectation of discrete random variable. Theorems on expectation of Sum and product of two discrete random variables.	15	30
2.	**(i) Finite difference and Interpolation :** Delta (Δ) and E operators, their relation and properties, Construction of forward and backward difference tables. Rational integral function, Derivation of Newton's forward, Newton's backward and Langrange's interpolation formulae with related examples, advantages and disadvantages of the above formulae.	10	20
	(ii) Numerical Integration : Meaning of numerical integration and its advantages over definite integral. Derivation of General Quatrature Formula. Deductions of Trapezoidal's rule, Simpson's $\frac{1}{3}^{rd}$ rule and $\frac{3}{8}^{th}$ rule with related examples.	10	15

Unit	Contents	Marks	Periods
3.	**Standard distributions :** Bernoulli trial, Derivation of Binomial and Poisson distribution and their means and variances. Normal distribution, its importance and some basic properties (without derivation).	10	15
4.	**Theory of Attributes :** Concept of attribute, positive and negative classes, order of classes, number of classes, class frequencies upto 3 (three) attributes, independence, association and consistency of attributes. Yule's coefficient of association and Contigency table.	10	20
5.	**Theory of Estimation and Testing of Hypothesis :** Concept of estimation, biased and unbiased estimators, simple and composite hypothesis, Null hypothesis, Alternative hypothesis. Critical and non-critical regions. Concept of type I and type II errors, Level of significance, concept of degrees of freedom. Test of significance for small sample based on student's t, Fisher's t X^2 (chi square) and F.	15	25
6.	**Vital Statistics :** Meaning of Vital Statistics and its uses. Methods of obtaining Vital Statistics. Measurement of Mortality Rates–CDR, SPDR and STDR. Measurement of fertility and reproductive rates–CBR, GRR, TFR and NRR, construction of complete life-table.	10	25

PRESCRIBED TEXTBOOKS :

1. Fundamental of Mathematical Statistics
   By : S.C. Gupta and V.K. Kapoor (Shultan Chand & Sons)
2. Fundamental of Applied Statistics
   By : S.C. Gupta and V.K. Kapoor (Shultan Chand & Sons)
3. Calculus of Finite Difference
   By : H.C. Saxena (S. Chand & Co. Ltd.)

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DESIGN OF QUESTION PAPER

Subject : **STATISTICS**
Class : XII
Full Mark : 80
Time : 3 Hours

I — WEIGHTAGE TO OBJECTIVES:

Objectives	Marks	Percentage
Knowledge(K)	12	15
Understanding (U)	40	50
Application (A)	24	30
Skill (S)	04	05
Total :	**80**	**100**

II — WEIGHTAGE TO FORMS OF QUESTIONS:

FORM OF QUESTIONS	No. of questions	Time (in minutes)	Marks	Percentage
Essay/Long Answer (E/LA)	06	67	30	37
Short Answer (SA-I)	03	27	12	15
Short Answer (SA-II)	04	27	12	15
Short Answer (SA-III)	05	23	10	13
Very Short Answer(VSA)	06	13	06	07
MCQ	10	23	10	13
Total:	**34**	**180**	**80**	**100**

WEIGHTAGE TO CONTENT:

Unit	CONTENTS :	Marks	Percentage
1	Probability and Expectation	15	18.75
2	(i) Finite difference and Interpolation	10	12.50
	(ii) Numerical Integration	10	12.50
3	Standard Distributions	10	12.50
4	Theory of Attributes	10	12.50
5	Theory of Estimation and Testing of Hypothesis	15	18.75
6	Vital Statistics	10	12.50
	Total:	**80**	**100**

IV — SCHEME OF SECTIONS : NIL

V — SCHEME OF OPTIONS : Internal option in one SA-I (case study question), two in SA-II, one in SA-III and three in E/LA

VI — DIFFICULTY LEVEL :

Difficult : 30% of the total marks
Average : 50% of the total marks
Easy : 20% of the total marks

Special Instruction: 1) Two questions of MCQ will be Assertion-Reason type question.
2) First option will be (a) & second option will be (b) in the internal option

Abbreviation : K(Knowledge),U(Understanding), A (Application), Skill(S), E(Essay Type), SA (Short Answer Type), VSA (Very Short Answer Type), MCQ(Multiple Choice Question)

INTERNAL ASSESSMENT	20 MARKS
Periodic Tests (Best 2 out of 3 tests conducted)	10 Marks
Field/Project Works	10 Marks

Conduct of Periodic Tests:

Periodic Test is a Pen and Paper assessment which is to be conducted by the respective subject teacher. The format of periodic test must have questions items with a balance mix, such as, very short answer (VSA), short answer (SA) and long answer (LA) to effectively assess the knowledge, understanding, application, skills, analysis, evaluation and synthesis. Depending on the nature of subject, the subject teacher will have the liberty of incorporating any other types of questions too. The modalities of the PT are as follows:

a) Mode: The periodic test is to be taken in the form of pen-paper test.

b) Schedule: In the entire Academic Year, three Periodic Tests in each subject may be conducted as follows:

Test	Pre-Mid-Term (PT-I)	Mid-Term (PT-II)	Post Mid-Term (PT- III)
Tentative Month			

This is only a suggestive schedule and schools may conduct periodic tests as per their convenience.

c) Average of Marks: Once schools complete the conduct of all the three periodic tests, they will convert the weightage of each of the three tests into ten marks each for identifying best two tests. The best two will be taken into consideration and the average of the two shall be taken as the final marks for PT.

d) The school will ensure simple documentation to keep a record of performance

FOR PROJECT WORK/ FIELD WORK:

i) The **Project Work/Field Work** shall be assigned by the subject teacher(s) in accordance with the prescribed **Class XII syllabus of the COHSEM**.

(ii) Where the number of students exceeds **twenty (20)**, different topics should b assigned to different groups, each group comprising of not more than 20 students.

(iii) The **Project Work/Field Work report** shall be **handwritten** and submitted to the concerned department of the institution **on or before 31st December** of the academic year.

FROM THE ACADEMIC SESSION 2027-2028

STATISTICS

Theory

CLASS- XII

One Paper **Time: 3 Hours** **70 Marks**

Unit No.	Contents	Marks
1	Mathematical Preliminaries	10
2	Theory of Probability	10
3	Probability distributions and Mathematical Expectation	10
4	Standard Distributions	9
5	Theory of Attributes	9
6	Theory of Estimation and Testing of Hypothesis	12
7	Vital Statistics	10

Unit	Contents	Marks	Period
1	**Mathematical Preliminaries:** Basic concepts of Set, Types of Sets (Empty, Singleton, Finite, Infinite, Universal, Equal sets; Set operations: Union of sets, Intersection of sets, complement of sets, difference of sets; Laws of sets (without proof): commutative law, associative law, distributive law, De-Morgan's laws of two sets; Venn diagram (up to two sets); Permutations and Combinations, their properties and applications; Concept of functions, Domain, Co-domain and Range of a function; Concept of Differentiation, Additive Rule and Product Rule of Differentiation (without proof); Concept of Integration and its fundamental theorems (statement only).	10	20
2	**Theory of Probability:** Random Experiment, Sample space, Trial, Event, Equally likely events, Mutually exclusive events and Exhaustive events, Favourable Cases, Independent events, Simple and Compound events, Complementary events, Mathematical and Statistical definitions of probability, Conditional probability, Additive and Multiplicative laws of probability and their applications.	10	20
3	**Probability distributions and Mathematical Expectation:** Random Variable (discrete and continuous) and its probability distribution, Probability mass function (p.m.f.), Probability density function (p.d.f.), Cumulative distribution function of a random variable, Properties of distribution functions (without proof); Mathematical Expectation of a random variable (both discrete and continuous); Properties of Expectation –(i) E (a) = a, and (ii) E (aX) = a E(X); Addition and Multiplication theorems of expectation of two random variables.	10	20
4	**Standard distributions:** Bernoulli, Binomial and Poisson distributions; their means, variances and recurrence relations for probabilities; Normal distribution – basic concept and its p.d.f., importance and chief characteristics (without proof).	9	15
5	**Theory of Attributes:** Concepts of attribute, positive and negative classes, contrary and ultimate classes, order of classes, number of classes, class frequencies upto 3(three) attributes, independence, association and consistency of attributes, Yule's coefficient of association and Contingency table (for only two attributes).	9	15
6	**Theory of Estimation and Testing of Hypothesis:** Estimation: Idea of Inference, Concept of estimation, Point estimation, Estimator and estimate, biased and unbiased estimators; Testing of Hypothesis: Simple and composite hypotheses, Null and Alternative hypotheses, Critical and non-critical regions, Concept of type-I and type-II errors, Level of significance, Power of a test, concept of degrees of freedom, Test of significance for small sample based on t-test for (i) single mean, (ii) difference of two means, and (iii) paired-t; χ^2 $(Chi-square)$ test for the variance of a Normal population; F-test for equality of variances of two Normal populations.	12	25
7	**Vital Statistics:** Meaning of Vital Statistics and its uses; Methods of obtaining Vital Statistics; Measurement of Mortality Rates – CDR, SDR and STDR; Measurement of fertility and reproductive rates – CBR, GFR, SFR, ASFR, TFR and their applications; Sex Ratio.	10	20

PRESCRIBED TEXTBOOKS:

1. Fundamentals of Mathematical Statistics
   By: S.C. Gupta and V.K. Kapoor [Sultan Chand & Sons]
2. Fundamentals of Applied Statistics
   By: S.C. Gupta and V.K. Kapoor [Sultan Chand & Sons]
3. NCERT Mathematics Textbook for Class–XI
4. NCERT Mathematics Textbook for Class-XII

STATISTICS

Practical

CLASS–XII

Full Mark–30

Time–3 hours

LIST OF PRACTICALS

1. Checking whether a given coin or dice is unbiased or not by tossing/throwing repeatedly.
2. Fitting of Binomial and Poisson distributions and computation of expected frequencies, mean and variance.
3. Calculation of expected class frequencies based on the given data for attributes.
4. Test of Consistency of data upto two attributes. Testing of independence and association of two attributes.
5. Yule's coefficient of association (Q) and its interpretation.
6. t–test for (i) single mean, (ii) difference of two means, (iii) Paired-t.
7. χ^2test for the variance of a Normal Population.
8. F–test for the equality of variances of two Normal Populations.
9. Calculation of CDR, DR and STDR.
10. Calculation of CBR, GFR, SFR, ASFR, TFR and Sex Ratio.

NOTE: Components of Practical.

1.	To attempt any 3 (three) experiments out of 5 (five) experiments.	(3×7=21 marks)
2.	Note Book.	(5 marks)
3.	Viva–voce	(4 marks)
	Total:	30 marks

DESIGN OF
QUESTION PAPER

Subject : STATISTICS
Paper : Theory
Class : XII
Full Mark : 70
Time : 3 Hours

I — WEIGHTAGE TO OBJECTIVES

Objectives	Marks	Percentage
Knowledge (K)	10	14
Understanding (U)	35	50
Application (A)	21	30
Skill (S)	4	6
Total:	**70**	**100**

II — WEIGHTAGE TO FORMS OF QUESTIONS:

Form of Questions	No. of Question	Time (in minute)	Marks	Percentage
Essay/Long Answer (E/LA)	3	39	15	21
Short Answer (SA-I)	6	46	18	26
Short Answer (SA-II)	10	51	20	29
Very Short Answer (VSA)	7	18	7	10
MCQ	10	26	10	14
Total:	**36**	**180**	**70**	**100**

III — WEIGHTAGE TO CONTENT:

UNIT	CONTENTS	Marks	Percentage
1	Mathematical Preliminaries	10	14
2	Theory of Probability	10	14
3	Probability Distributions and Mathematical Expectation	10	14
4	Standard distributions	9	13
5	Theory of Attributes	9	13
6	Theory of Estimation and Testing of Hypothesis	12	18
7	Vital Statistics	10	14
	Total :	**70**	**100**

IV — SCHEME OF SECTIONS :NIL

V — SCHEME OF OPTIONS : i) Internal option will be given in 2 (two) Essay Type Questions
ii) Internal option will be given in 3 (three) Questions of SA-I including one case study/source based question.

VI — DIFFICULTY LEVEL :

Difficult : 30% of total mark
Average : 50% of total mark
Easy : 20% of total mark

Special Instruction:

1) Two questions of MCQ will be assertion-reason type question.
2) One question of SA-I will be case study/source based question.
3) First option will be (a) & second option will be (b) in the internal option

Abbreviation : K(Knowledge),U(Understanding), A (Application), Skill(S), E(Essay Type), SA (Short Answer Type), VSA (Very Short Answer Type), MCQ(Multiple Choice Question)