

SWAMI RAMANAND TEERTH
MARATHWADA UNIVERSITY, NANDED.

SYLLABUS
OF
STATISTICS

B.A./B.Sc.Second year

Continuous Probability Distributions and Applications

Paper-IV

Statistical Methods and Inference

Paper-V

Practical - II

Paper -VI

Practical - III

Paper -VII

(Revised)
(2009-10)

STATISTICS

B.A/B.Sc. Second Year

Continuous Probability Distributions and Application

Paper-IV

Unit-I- Normal Distribution :- Probability density function, chief characteristics of normal distribution and normal probability curve, Mode, Median, Quartiles, moment generating function, cumulant generating function, moments. Additive property, Mean deviation about mean, Area property (Normal probability integral), Importance of normal distribution, fitting of normal distribution.

Unit II:-

- (i) Rectangular or Uniform distribution : Definition, Moments, Moment generating function, mean variance examples & problems
- (ii) Exponential Distribution :- Probability density function, Moment generating function, lack of memory property, problem.
- (iii) Gamma Distribution- Definition, moment generating function, cumulant generating function, limiting form of Gamma distribution, Additive property of Gamma distribution with parameters, problems, examples.

Unit III: Chisquare Distribution :- Chisquare variate, Derivation of Chisquare Distribution (Using method of moment generating function). Nature of chisquare probability curve, moment generating function of chisquare distribution, cumulant generating function of Chisquare distribution, limiting form of chisquare distribution for large degrees of freedom, Mode and Skewness of Chisquare distribution, additive property of chisquare distribution. Application of Chisquare distribution for testing of hypothesis (1) population variance (2) goodness of fit test. (3) Test of independence of attributes, contingency table, Yate's correction, for 2x2 contingency table. (4) homogeneity of correlation coefficients.

Unit IV :- t- Distribution, Student's statistic t, Derivation of student's t-distribution, moments of t-distribution, limiting form of t-Distribution, graph of t-distribution. Applications of t-distribution for testing of hypothesis (1) t-

test for single mean, (2) t- test for difference of means (paired & unpaired), (3) t- test for testing the significance of an observed sample correlation coefficient.

Unit-V :-F- Distribution:-F- Statistic, P.d.f. moments of F. distribution, mode of F- distribution, F- test for equality of two population variances, Relation between F-& t distribution, F and Chisquare distribution.

Scope of syllabus

(i) Fundamentals of Mathematical statistics S.C. Gupta V.K. Kapoor

(11 th Education) Sultan chand and sons Delhi

Chapter 9 :-

9.2, 9.2.2, 9.2.3, 9.2.4, 9.2.5, 9.2.6, 9.2.7,

9.2.8, 9.2.10, 9.2.11,9.2.13, 9.2.14

9.3.-, 9.3.1,9.3.2

9.5, 9.5.1, 9.5.2, 9.5.3,9.8,9.8.1

Chapter :- 15:- 15.1, 15.2, 15.3, 15.3.1, 15.3.2, 15.3.4

15.3.5, 15.3.6, 15.6,15.6.1, 15.6.2, 15.6.3, 15.6.4, 15.6.6

Chapter 16:- 16.1, 16.2,16.2.1,16.2.4,16.2.5,16.2.6,

16.31,16.3.2,16.3.3,16.3.4

16.5, 16.5.1,16.5.2,16.5.3,16.6.1,16.7,16.8

Reference Books:-

- 1) Statistics P.G. Dixit P.S. Kapre (Nirali publication pune)
- 2) Mathematical Statistics Freund J.E. Prentics Hall of India.
- 3) Introduction to Probability Theory and Mathematical Statistics - V.K. Rohatgi (Wiely Estem ltd)
- 4) Fundamentals of statistics volume-I A.M. Goon, Gupta and DasGupta (world press Kolkotta)
- 5) Statistical methods - S.P. Gupta. (Sultan chand and sons Delhi)
- 6) Common Statistical Tests . Kulkarni M.B. Ghatpande S.B, Gore S.D., (Satyajeet Prakashan Pune-29)

STATISTICS

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Statistical Methods and Inference

Paper-V

Unit-I Correlation :- Multiple and partial correlation (for trivariate data) Yule's Notation, plane of regression, properties of residuals, variance of the residual, coefficient of multiple correlation, properties of multiple correlation coefficient, coefficient of partial correlation.

Unit II:- Time Series:- Meaning of time series, components of time series, Trend, seasonal variation, cyclical variation, irregular component, Analysis of time series, uses of time series, measurement of trend. Graphic method, Method of semi averages. Method of moving averages, Method of least squares, Measurement of Seasonal fluctuations by Method of Simple averages, Ratio to trend method, Ratio to moving average method. Autoregressive models AR(I)

Unit- III Estimation :- Parameter space, characteristics of Estimators, unbiasedness, consistency, Efficient Estimators, Most Efficient, Estimator, Efficiency Minimum variance unbiased (MVU) Estimators, sufficiency, Cramer Rao Inequality, Methods of Estimation, Method of Maximum likelihood estimation. Method of moments. Interval Estimation, Confidence interval and Confidence limits.

Unit iv :- Large Sample Tests:- Test of significance for large samples, Single proportion, difference of proportions, confidence Limits. Test of Significance for single mean, Test of significance for difference of means, Test of significance for the equality of variances. problems.

Unit V :- Testing of Hypothesis :

1) Introduction Simple Hypothesis, Composite hypothesis, Alternative hypothesis Two types of Errors, Critical region, Level of Significance, Power of the Test, Most powerful test, Uniformly most powerful test,

2) Non Parametric Tests:- Introduction, Sign test, Run test, Median test, Mann-Whitney test, advantage and disadvantages.

Scope of Syllabus

(i) Fundamentals of Mathematical statistics :- S.C. Gupta V.K. Kapoor

(Sultan Chand and Son New Delhi)

Chapter 12:- 12.4,12.4.1,12.5,12.6,12.6.1,12.7,12.7.1,12.8,12.8.1

Chapter 14:- 14.6, 14.7, 14.7.1, 14.7.2, 14.8.3, 14.8.4 ,14.8.5

Chapter 17:- 17.1,17.2,17.2.1,17.2.2,17.2.3,17.3, 17.2.4,17.3, 17.6.2 17.6.3, 17.7
Theorems 17.1 17.3, 17.5 17.6, 17.6.1, 17.15,

Chapter 18:-

18.1,18.2,18.2.1,18.2.2,18.2.3,18.2.4,18.2.5,18.2.6,18.2.7,18.3,18.4.,18.4.2

(ii) Fundamentals of Applied Statistics:- S.C. Gupta V.K. Kapoor
(Sultan chand and sons)

2.1,2.2.1,2.2.2,2.2.3,2.3,2.3.1,2.4.1,2.4.2,2.4.3,2.5,2.5.1,2.5.2,2.5.3,2.7.1,2.7.2.

(iii) Statistical Methods:- A.R. Chandekar (S. Chand & Co.Ltd. New Delhi)
Chapter 11.1,11.2,11.3,11.4,11.5,11.7

vi) Non parameteric Statistical Inference :- J. D. Gibbons.

Reference Books:

i) Fundamentals of Statistics Volume-I,(1991) Goon A.M. Gupt M.K.
Dasgupta B. (World Press Calcutta)

(ii) Introduction to the Theory of statistics:- Mc GrawHill, Mood
A.M.Grayball F.A. Boes D.C. (1974)

(iii) Basic Concpetps of Probability and statistics:_- Hodges J.L., Lehman
E.L., Holden Day.

iv) Statistics :- P.G. Dixit, P.S. Kapre (Nirali Prakashan Pune.)

v) Statistics :- A Beginner's Text Volume-II B.R. Bhat T.
Shirvenkatramane K.I. Madhav Rao. (New Age International (P) Ltd.)

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PRATICAL - II

Paper-VI

Sr. No.	Title of the Experiment	No of Experiments
1	Measurement of Trend by method of semi averages	1
2	Measurement of Trend by moving averages	1
3	Measurement of linear Trend by method of least squares	3
4.	Fitting of AR (1) model	1
5	Measurement of seasonal variation by method of simple averages.	1
6	Measurement of seasonal variation by ratio to trend method	1
7	Measurement of seasonal variation by Ratio to moving average method	1
8	Large sample test for single mean	1
9	Large sample test for difference of means	1
10	Large sample test for single proportions	1
11	Large sample test for difference of proportions	1
12	Multiple Correlation coefficient (using MS EXCEL)	2
13	Partial Correlation coefficient	2
14	Sign test for single sample & two sample	2
15	Run Test	2
16	Median Test	2
17.	Mann - whitney Test	2

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PRACTICAL - III

Paper-VII Sevan

Sr. No.	Title of the Experiments	No of Experiments
1	Fitting of Normal distribution	2
2	Problems based on area property of Normal distribution	1
3	Chisquare test for population variance	1
4.	Chisquare test for goodness of fit	3
5	Chisquare test for 2x2 contingency table also using Yate's correction.	2
6	Chisquare test for Independence of attributes	2
7	Chisquare test of Homogeneity of Correlation coefficients	1
8	t - Test for single mean	1
9	t - Test for difference of means	1
10	Paired t - Test for difference of means	1
11	t - Test for testing the significance of an observed sample correlation coefficient	1
12	F- Test for equality of two population variances	2
13	Estimation by method of moments	1
14	Estimation by method of maximum likelihood estimation	1
15	Construction of confidence interval for mean and proportion.	1