Statistics I Semester syllabi w.e.f. 2016-17 Admitted Batch.pdf

Statistics Syllabus.pdf

Statistics III Semester syllabi w.e.f. 2015-16 Admitted Batch.pdf

STAT_IVSem_2015-16AB.pdf

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ADIKAVI NANNAYA UNIVERSITY
RAJAMAHENDRAVARAM
CBCS / Semester System
(W.e.f. 2016-17 Admitted Batch)
I Semester Syllabus
B.A. / B.Sc. STATISTICS
(With Mathematics Combination)

DESCRIPTIVE STATISTICS AND PROBABILITY

Unit-I

Introduction to Statistics: Concepts of Primary and Secondary data. Methods of collection and editing of primary data, Secondary data. Designing a questionnaire and a schedule. Measures of Central Tendency - Mean, Median, Mode, Geometric Mean and Harmonic Mean.

Unit-II

Measures of dispersion: Range, Quartile Deviation, Mean Deviation and Standard Deviation. Descriptive Statistics - Central and Non-Central moments and their interrelationship. Sheppard's correction for moments. Skewness and kurtosis.

Unit-III

Introduction to Probability: Basic Concepts of Probability, random experiments, trial, outcome, sample space, event, mutually exclusive and exhaustive events, equally likely and favourable outcomes. Mathematical, Statistical, axiomatic definitions of probability. Conditional Probability and independence of events,

Unit-IV

Probability theorems: Addition and multiplication theorems of probability for 2 and for n events. Boole's inequality and Baye's theorems and problems based on Baye's theorem.

Unit-V

Random variable: Definition of random variable, discrete and continuous random variables, functions of random variable. Probability mass function. Probability density function, Distribution function and its properties. Bivariate random variable - meaning, joint, marginal and conditional Distributions, independence of random variables.

Practicals

Conduct any 6 (Ms-exel is compulsory)

1. Computation of mean, median and mode.
2. Computation of quartile deviation.
3. Computation of mean deviation
4. Computation of Standard deviation.
5. Non-central moments and central moments, Sheppard corrections & Skewness based on moments and Kurtosis
6. MS-Excel methods for the above Serial numbers 1,2,3,4.

Note:
MS-Excel methods to be made mandatory for all the Semesters after proper training only to the teaching staff by the University concerned.

Text Books:

1. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2 BA/BSc I year statistics - descriptive statistics, probability distribution - Telugu Academy - Dr M.Jaganmohan Rao,Dr N.Srinivasa Rao, Dr P.Tirupathi Rao, Smt.D.Vijayalakshmi.
3. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI

Reference books:

1. Willam Feller: Introduction to Probability theory and its applications. Volume –I, Wiley
2. Goon AM, Gupta MK, Das Gupta B : Fundamentals of Statistics , Vol-I, the World Press Pvt.Ltd., Kolakota.
3. Hoel P.G: Introduction to mathematical statistics, Asia Publishing house.
4. M. JaganMohan Rao and Papa Rao: A Text book of Statistics Paper-I.
5. Sanjay Arora and Bansi Lal: New Mathematical Statistics: Satya Prakashan , New Delhi
6. Hogg Tanis Rao: Probability and Statistical Inference. 7^{th} edition. Pearson.

ADIKAVI NANNAYA UNIVERSITY
RAJAHMUNDRY

CBCS/Semester System

II SEMESTER : STATISTICS (common for B.A./B.Sc.)

(for 2016-17 Admitted Batch)

MATHEMATICAL EXPECTATION AND PROBABILITY DISTRIBUTIONS

Unit-I

Mathematical expectation: Mathematical expectation (ME) of a random variable and function of a random variable. Moments and covariance using mathematical expectation with examples. Addition and Multiplication theorems on expectation. Definitions of M.G.F, C.G.F, P.G.F, C.F its properties. Chebyshev and cauchy - Schwartz inequalities.

Unit-II

Discrete Distributions : Binomial and Poisson distributions, their definitions, 1^{st} to 4 central moments, M.G.F, C.F, C.G.F, P.G.F, mean, variance, additive property if exists. Possion approximation to Binomial distribution.

Unit-III

Negative Binomial, geometric, hyper geometric distributions - Definitions, means, variances, M.G.F, C.F, C.G.F, P.G.F, reproductive property if exists. Binomial approximation to Hyper Geometric Distribution, Poisson approximation to Negative binomial distribution.

Unit-IV

Continuous Distributions: Rectangular, Exponential, Gamma, Beta Distributions of two kinds. Other properties such as mean , variance, M.G.F, C.G.F, C.F, reproductive property.

Unit - V

Normal Distribution: Definition, Importance, Properties, M.G.F, additive properties, Interrelation between Normal and Binomial, Normal &Poisson distribution. Cauchy Distribution.

Text Books:

1. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. BA/BSc I year statistics - descriptive statistics, probability distribution - Telugu Academy - Dr M.Jaganmohan Rao,Dr N.Srinivasa Rao, Dr P.Tirupathi Rao, Smt.D.Vijayalakshmi
3. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI.

Reference books:

1. Willam Feller : Introduction to Probability theory and its applications. Volume –I, Wiley
2. Goon AM, Gupta MK, Das Gupta B : Fundamentals of Statistics , Vol-I, the World Press Pvt.Ltd., Kolakota.
3. Hoel P.G: Introduction to mathematical statistics, Asia Publishing house.
4. M. JaganMohan Rao and Papa Rao: A Text book of Statistics Paper-I.
5. Sanjay Arora and Bansi Lal: New Mathematical Statistics: Satya Prakashan , New Delhi
6. Hogg Tanis Rao: Probability and Statistical Inference. 7th edition Pearson.

Practicals

Conduct any 6 (Ms-exel is compulsory)

1. Fitting of Binomial Distribution – Recurrence relation method.
2. Fitting of Poisson Distribution - Recurrence relation method.
3. Fitting of Negative Binomial Distribution.
4. Fitting of Geometric Distribution.
5. Fitting of Normal Distribution - Areas methods.
6. Fitting of Normal Distribution - Ordinates methods.
7. MS-Excel methods for the above Serial Numbers 1 and 2

ADIKAVI NANNAYA UNIVERSITY
RAJAMAHENDRAVARAM
CBCS / Semester System
(W.e.f. 2015-16 Admitted Batch)
III Semester Syllabus
B.A. / B.Sc. STATISTICS
(With Mathematics Combination)
STATISTICAL METHODS

Unit-I

Correlation: Def.,scatter diagram ,its coefficient and its properties., scatter diagram, computation of correlation coefficient for ungrouped data. spearman's rank correlation coefficient, properties of spearrman's correlation coefficients and problems.

Unit-II

Regression: simple linear regression, properties of regression coefficients. Regression lines, Concept of Correlation ratio, partial and multiple correlation coefficients, correlation verses regression and their problems.

Unit – III

Curve fitting: Method of least square - Fitting of linear, quadratic, Exponential and power curves and their problems.

Unit-IV

Attributes : Introduction, Nature, and consistency and mention its conditions. Independence and association of attributes, co-efficient of association, coefficients of contingency and their problems.

Unit –V

Exact sampling distributions: Concept of population, Parameter, random sample, statistic, sampling distribution, standard error. Statement and Properties of $\chi 2$, t, F distributions and their interrelationships.

Text books

1. BA/BSc II year statistics - statistical methods and inference - Telugu Academy by A.Mohanrao, N.Srinivasa Rao, Dr R.Sudhakar Reddy, Dr T.C. Ravichandra Kum.
2. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI.
3. Fundamentals of Mathematics statistics: VK Kapoor and SC Guptha.

Reference Books:

1. Outlines of statistics, Vol II : Goon Guptha, M.K.Guptha, Das Guptha B.
2. Introduction to Mathematical Statistics : Hoel P.G.

Practicals

Conduct any 6 (Ms-exel is compulsory)

1. Fitting of straight line.
2. Fitting of exponential curves.
3. Fitting of power curve.
4. Computation of correlation coefficient & Fitting of Regression lines.
5. Rank correlation coefficient.
6. Computation of Contingency coefficients.
7. MS-Excel methods any for the Serial Numbers 1,2,4,5.

BA/BSC II YEAR : STATISTICS SYLLABUS
(With Mathematics Combination)
Semester - IV CBCS.

Paper - IV : Statistical Inference

UNIT-I

Theory of estimation: Estimation of a parameter, criteria of a good estimator – unbiasedness, consistency, efficiency, &sufficiency and. Statement of Neyman's factorization theorem. Estimation of parameters by the methods of moments and maximum likelihood (M.L), properties ofMLE's. Binomial, Poisson &Normal Population parameters estimate by ML method. Confidence intervals of the parameters of normal population.

UNIT II

Concepts of Statistical hypothesis: Null and alternative hypothesis, critical region, two types of errors, level of significance, power of a test. 1 tailed, 2 tailed tests, Neyman - Pearson's lemma. Examples in of Binomial. Poisson, Normal distributions.

Unit-III

Large Sample Tests : Large sample tests for single mean, two means, Single proportion, Two proportions, Standard Deviation of single and double samples andFisher's Z transformation .

Unit-IV

Small sample tests: Tests of significance based on $\chi 2$, t and F. $\chi 2$-test for test for independence of attributes, t-test for single, double and paired tests, Variance Ratio Test(F-test).

Unit-V

Non-parametric tests - Advantages and Disadvantages. Two sample run test, Two sample Median test and Two sample sign test.

TEXT BOOKS

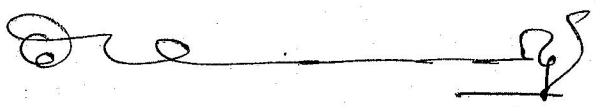
1. BA/BSc II year statistics - statistical methods and inference - Telugu Academy by A.Mohanrao, N.Srinivasa Rao, Dr R.Sudhakar Reddy, Dr T.C. Ravichandra Kumar.
2. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI.

REFERENCE BOOKS:

1. Fundamentals of Mathematics statistics : VK Kapoor and SC Guptha.
2. Outlines of statistics, Vol II : Goon Guptha, M.K.Guptha, Das Guptha B.
3. Introduction to Mathematical Statistics : Hoel P.G.

Practicals Semester – IV
Conduct any 6 (Ms-excel is compulsory)

1.Large sample tests for mean(s).
2. Large sample tests for proportion(s).
3. Large sample tests for standard deviation(s).
4.Large sample tests for Fisher's Z- transformation.
5.Small sample tests for Single and Doublet-test.
6.Small sample tests for Paired t-test.
7.F-Test.
8. Chi square test for independence of attributes.
9.Non-parametric testst – run test.
10.Non-parametric tests - mediantest.
11Non-parametric tests - sign tests.
12.MS-Excel methods for the above Serial Numbers 1,2,3,4.(any one of above)



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ADIKAVI NANNAYA UNIVERSITY:: RAJAMAHENDRAVARAM

BA/BSC III YEAR : STATISTICS SYLLABUS

(With Mathematics Combination)

Semester-V CBCS.

Paper - V : Sampling Techniques and Design of Experiments

Unit-I

Sampling Theory: Principle steps in a sample survey, Censes versus sample survey, sampling and Non-sampling errors.Types of sampling - subjective, probability and mixed sampling methods.

Unit-II

Simple Random Sampling : Meaning of Samples and methods to draw, estimation of population mean, variances in SRSWR& SRSWOR. Advantages and Disadvantages of thesemethods.

Unit-III

Stratified Random sampling: Proportional and optimum allocation of sample sizes in stratification. Variances of these methods. Comparison of their relative efficiencies. Advantages and Disadvantages of stratified sampling. concept of systematic sampling Advantages and disadvantages.

Unit-IV

Analysis of Variance: Causes of variation, Statement of Cochran's theorem, One - way with equal and unequal classifications and two way classifications.

Unit – V

Design of Experiments: Principles of experimentation in Designs, analysis of completely randomised design (CRD), Randomised block design (RBD) and Latin square design (LSD),efficiency of these designs. Concept of Factorial experiments.

Text Books:

1.TeluguAcademyBA/BSc III year paper - III Statistics - applied statistics - Telugu academy by

prof.K.SrinivasaRao, Dr D.Giri. Dr A.Anand, Dr V.PapaiahSastry.

2. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI.

Reference Books:

1.Fundamentals of applied statistics : VK Kapoor and SC Gupta.

2.AnuvarthitaSankyakaSastram - Telugu Academy.

Practicals Semester – V Conduct any 6 (Ms-exel is compulsory)

1. Estimation of population Mean, variance by SRSWOR.

2. Estimation of population Mean, variance by SRSWR.

3. ANOVA One –way classification.

4. ANOVA-CRD.

5. ANOVA - RBD.

6. ANOVA - LSD.

7. Ms-excel methods for the above serial numbers 4,5,6(any one)

BA/BSC III YEAR : STATISTICS SYLLABUS

(With Mathematics Combination)

Semester-V CBCS.

Paper - VI Quality and Reliability

Unit-I Importance of SQC in industry, statistical basis of shewart control charts, uses of control charts., control limits, Natural tolerance limits and specification limits.concept of six-sigma

Unit – II

Variable Control Chart: Construction of mean , R ,s.d,charts for variables, Interpretation of control charts

Attribute control charts- nP, P charts, C chart, Interpretation of control charts.

Unit-III

Acceptance sampling plans: Scope, Producer's risk and consumer's risk . Concepts of AQL and LTPD.

Unit-IV

Sampling Plans: Single and double sampling plans, OC and ASN functions, Double and single Sampling plans for attributes using Binomial.

Unit-V Reliability: Introduction, failure rates, Hazard function, estimation of reliability, exponential distribution as life model, its memoryless property.

Text Books:

1.BA/BSc III year paper - IV Statistics - applied statistics - Telugu academy by Prof.K.SrinivasaRao, Dr D.Giri. Dr A.Anand, Dr V.PapaiahSastry.

2. Fundamentals of applied statistics : VK Kapoor and SC Gupta

3. S.K Sinha: Reliability and life testing. Wiley Eastern.

Reference Books :

1.. R.C.Gupta: Statistical Quality Control.

Practical's - Semester – V Conduct any 6 (Ms-excel is compulsory)

1Construction of(mean ,R) charts.

2.Construction of P-chart-Fixed sample size.

3. Construction of P-chart-variable sample size

4.Construction of nP-Chart .

5.Construction of C-Chart.

6.MS-Excel methods for the Serial Numbers 1.

7.MS-Excel methods for the Serial Numbers 2 to 4.(any one)

B.A/B.Sc III YEAR STATISTICS (with Mathematics Combination)

Paper-V –SAMPLING TECHINIQUES AND DESIGN OF EXPERIMENTS

SEMESTER –V MODEL QUESTION PAPER

SECTION-A (5 x 5M = 25Marks)

ANSWER ANY FIVE QUESTIONS. Each Question carries equal marks

1. what are the advantages and limitations of sampling?
   ప్రతీరూపము యొక్క సదుపాయాలు మరియు పరిధులు ఎన్ని?
2. Explain the advantages of sampling over census.
   సెన్సస్ కన్నా ప్రతిరూపగ్రహణ పద్ధతిలో గల సదుపాయోగములు వివరింపుము?
3. Explain the need for stratification.
   స్తరితాల ఆవశ్యకతను వివరించండి.
4. How do you estimate population mean in proportional allocation?
   అనుపాతీయ కేటాయింపు ద్వారా లోక అంకమధ్యమాన్ని ఎలా అంచనా వేస్తారు?
5. What is meant by Simple Random Sampling With and With Out Replacement?
   తిరిగి చేర్చే మరియు చేర్చని యాదృచ్ఛిక శాంప్లింగ్ విధానము అనగా నేమి?
6. Explain the fixed effect and Random effect model.
   ఫిక్సిడ్ మరియు ప్రతిరూప ఎఫెక్ట్ మోడల్ గురించి వివరింపుము?
7. Discuss the efficiency of RBD over CRD.
   సంపూర్ణ యాదృచ్ఛికీకృత రచనను పోల్చినపుడు యాదృచ్ఛికీకృత ఖండ రచన యొక్క సామార్థ్యము గురించి వివరింపుము?
8. What are the advantages of RBD over CRD.
   సి.ఆర్.డి పై ఆర్.బి.డి యొక్క సదుపాయములను తెలుపుము?

SECTION-B (5 x 10M = 50Marks)

Answer All the questions, each question carries TEN marks

9. (a) Explain principle steps in a sample survey.
   శాంపిల్ సర్వే సూత్రాలను వివరింపుము?

   (or)

   (b) Explain sampling and Non-Sampling Errors.

ప్రతిరూప మరియు అప్రతిరూప దోషాలను వివరింపుము?

10. (a) In simple Random sampling with our replacement, show that sample mean is an unbiased estimate of population mean. Derive its standard error.

తిరిగిచేర్చని సరళి యాదృచ్ఛిక ప్రతిరూప సంగ్రహణ పద్ధతిలో ప్రతిరూప అంకమధ్యమము, లోకపు అంకమధ్యమానికి ఒక నిష్పాక్షిక అంచనాధారమని చూపుము. దీని క్రమ దోషమును ఉత్పాదించుము

(or)

(b) In simple Random sampling without replacement, show that s^2 is an unbiased estimate of S^2.

తిరిగిచేర్చని సరళయాదృచ్ఛిక ప్రతిరూప సంగ్రహణ విధానములో అనునది యొక్క ఒక నిష్పాక్షిక అంచనా అని నిరూపించండి?

11. (a) Obtain the variance of the sample mean of stratified Random sample under proportional allocation and Neyman's allocation. Also find the gain in efficiency due to optimum allocation

సరిత యాదృచ్ఛిక ప్రతిరూపగ్రహణ పద్ధతిలో ప్రతిరూప సరాసరి యొక్క విస్తృతులను అనుపాత కేటాయింపు మరియు కేటాయింపులను ఉపయోగించి కనుగొనుము మరియు అభిలషనీయ కేటాయింపు వలన పొందిన సార్ధకతను కనుగొనుము

(or)

(b) In Neyman's optimum allocation show that $n_i \alpha N_i S_i$

నేమాన్ అత్యనుకూల కేటాయింపులో అని $n_i \alpha N_i S_i$ చూపుము

12. (a) Explain the analysis of variance of Two-Way classification.

ద్వితీయ వర్గీకరణ దత్తాంశమును విశ్లేషంచే పద్ధతిని వివరింపుము

(or)

(b) Explain the analysis of variance of one-way classification

ఏక వర్గీకరణ దత్తాంశమును విశ్లేషించే పద్ధతిని వివరింపుము

13. (a) Explain the analysis of a Randomised Block Design

యాదృచ్ఛిక ఖండ రచన యొక్క విశ్లేషణను వివరింపుము

(or)

(b) Describe Latin square design and discuss its merits and demerits

లాటిన్ చతురస్ర రచనను వివరింపుము మరియు దీని యొక్క యోగ్యాతా యోగ్యతలను చర్చించుము.

B.A/B.Sc III YEAR STATISTICS (with Mathematics Combination)

Paper-VI –QUALITY AND RELIABILITY

SEMESTER –V MODEL QUESTION PAPER

SECTION-A (5 x 5M = 25Marks)

ANSWER ANY FIVE QUESTIONS. Each Question carries equal marks

1. How SQC play in maintaining the quality of product.

మెరుగైన ఉత్పత్తి కాపాడడం కోసం సాంఖ్యాంక గుణనియంత్రణ ఏవిధంగా పనిచేయును.

2. Explain the concept of six -sigma

6-సిగ్మా అను భావనను వివరింపుము

3. Explain the S.D chart.

క్రమ విచలన పటము వివరింపుము

4. Explain the C-chart.

సి-పటము వివరింపుము

5. Explain the concept of O.C curve.

O.C వక్రము అనే భావనను వివరింపుము

6. Using Binomial distribution ,Explain single and double sampling plans for attributes.

ఏక మరియు ద్వితీయ ప్రతిరూప ప్రణాళికలో ద్విపద విభాజనమును ఉపయోగించి సంగ్రహణ గుణ పట్టికలను వివరింపుము

7. Distinguish between single and double sampling plans

ఏక మరియు ద్వితీయ ప్రతిరూప ప్రణాళికల మధ్య వ్యత్యాసమును పోల్చుము

8. Explain the concept of Reliability.

విశ్వసనీయత అనే భావనను వివరింపుము

SECTION-B (5 x 10M = 50Marks)

Answer All the questions, each question carries TEN marks

9. (a) Explain Natural tolerance limits and Specification limits.

సహజ సాహ్య అవధులు మరియు నిర్దేశాంకావధులను వివరింపుము

(or)

(b) Discuss the importance of statistical quality control in industry.

పరిశ్రమలలో సాంఖ్యాంక గుణ నియంత్రణ యొక్క ప్రాముఖ్యతను చర్చించుము

10. (a) Explain the Mean and Range chart.

అంక మధ్య, వ్యాప్తి పటాలను వివరింపుము

(or)

(b) What are the charts for attributes? Explain the p, np chart..

గుణాత్మక పటాలు అంటే ఏమిటి? p, np పటాలు వివరింపుము

11. (a)Explain the situation where 100% inspection is needed. Explain the need for sampling inspection plan.

100 శాత పరీక్ష ఏ సందర్భంలో అవసరము వివరింపుము. ప్రతిరూప పద్ధతుల ఆవశ్యకతను వివరింపుము

(or)

(b) Explain the concepts (i) AQL (ii) LTPD (iii) Producers Risk (iv) Consumers Risk

(i) AQL (ii) LTPD

(iii) యాజమాన్య భాదకము (iv) వినియోగ దారుని భాదకము అనే భావనను వివరింపుము

12. (a) Explain the double sampling plan.

ద్వితీయ ప్రతిరూప ప్రణాళికను వివరింపుము

(or)

(b) Explain the single sampling plan

ఏక ప్రతిరూప ప్రణాళికను వివరింపుము

13. (a) Explain Exponential distribution as life model and give its memory less property.

ఘాత విభాజనాన్ని జీవిత పద్ధతిగా వివరించి ఆ విభాజనమునకు మర్చిపోయే ధర్మము కలదని తెలుపుము

(or)

(b) Explain Reliability functions and give its estimation.

విశ్వసనీయత ప్రమేయమును మరియు వాటి అంచనాను వివరింపుము

APPLIED STATISTICS PAPER VII - MODEL PAPERS.pdf

OPTIMIZATION TECHNIQUES VII - B - MQP.pdf

Model Questions Paper

III B.Sc., Degree Examination (at the end of VI Semester)

STATISTICS-Elective Paper

(With Mathematics Combination)

Paper – VII - A: Applied Statistics
(With effect from 2015-2016 admitted Batch)

Time: 3Hours **Max. Marks: 75 M**

PART: A

Answer any FIVE questions **5 x 5 = 25 M**

1. Explain the models of time series.
2. What do you know about link relative method?
3. What are uses and limitations of index numbers?
4. Explain Fixed and Chain base index numbers?
5. Define Demand and Supply.
6. Calculate 4 yearly centered moving averages for the following data.

Year	1	2	3	4	5	6	7	8	9	10
Production	430	470	450	460	480	470	470	500	490	480

7. Calculate the simple aggregative index number for the following data.

Commodity	A	B	C	D	E	F
Price in 2016	3.9	11.8	7	8	5.5	5.8
Price in 2017	4.25	15	9	7.15	6	7

8. What do you know about price elastics of supply?

PART: B

Answer ALL the following questions **5 x 10 = 50 M**

9. (a) Explain the components of a time series.

(Or)

(b) Explain the method of least squares to fit a straight line trend.

10. (a) Explain ratio to trend method to find the seasonal variations.

(Or)

(b) Explain C.S.O and N.S.S.O functions.

11. (a) Explain the problems involved in the construction of index numbers.

(Or)

(b) Explain any five weighted index numbers.

12. (a) Show that Fisher index number is an ideal index number.

(Or)

(b) Explain the method of constructing cost of living index numbers.

13. (a) Explain Leontief's Method.

(Or)

(b) Explain Pigou's Method.

# # #

Model Questions Paper

III B.Sc., Degree Examination (at the end of VI Semester)

STATISTICS-Cluster -A

(With Mathematics Combination)

Paper – VIII – A1: Demography and Vital Statistics
(With effect from 2015-2016 admitted Batch)

Time: 3Hours **Max. Marks: 75 M**

PART: A

Answer any FIVE questions **5 x 5 = 25 M**

1. What are the uses of Myer and UN indices?
2. Describe the uses of vital statistics.
3. Explain Stationary and Stable population.
4. Explain Total Fertility Rate.
5. Write Pearl's Vital Index.
6. Define Rates and Ratios.
7. Show that $q_x = \frac{2m_x}{2+m_x}$
8. Show that $e_x^o = \frac{1}{2} e_x$

PART: B

Answer ALL the following questions **5 x 10 = 50 M**

9. (a) Explain use of balancing equations.

(Or)

(b) Explain population composition and dependency ratio.

10. (a) Explain measurements of Mortality.

(Or)

(b)Explain the sources of collecting data on vital statistics.

11. (a) Explain construction of Life Table.

(Or)

(b) Explain Central Mortality and Force of Mortality.

12. (a) Explain construction of abridged life tables.

(Or)

(b) Explain measurements of Fertility.

13. (a) Explain measurements of Population Growth.

(Or)

(b) Explain the relation between Gross Reproduction Rate and Net Reproduction Rate.

# # #

Model Questions Paper

III B.Sc., Degree Examination (at the end of VI Semester)

STATISTICS-Cluster -A

(With Mathematics Combination)

Paper – VIII - A2: Advanced Experimental Designs
(With effect from 2015-2016 admitted Batch)

Time: 3Hours **Max. Marks: 75 M**

PART: A

Answer any FIVE questions **5 x 5 = 25 M**

1. Write the Analysis of C.R.D
2. Explain missing plot technique.
3. Explain the concept of Analysis of Covariance.
4. Write the analysis of 2^2 – Factorial experiments.
5. Explain Balanced Incomplete Block design.
6. Complete the ANOVA table.

Source	D.F	S.S	M.S.S
Blocks	5	21.55	-
Treatments	3	15.66	-
Error	-	-	-
Total	23	49.51	

7. Find the missing value in randomized block design Block Total is 68.4, Treatment Total is 50.9, Grand Total is 365.3, number of blocks is 4 and number of treatments is 6.

8. Write the Yates table in 2^2 – Factorial Experiment.

PART: B

Answer ALL the following questions **5 x 10 = 50 M**

9. (a) Explain the Analysis of Latin Square Design.

(Or)

(b) Explain the Analysis of Randomized Block Design.

10. (a) Explain the Analysis of Randomized Block Design with two missing Observations.

(Or)

(b) Explain the Analysis of Latin Square Design with one missing observation.

11. (a) Explain the Analysis of covariance for a one-way classification with one concomitant variable in C.R.D.

(Or)

(b) Explain the Analysis of covariance for two-way classification with one concomitant variable in R.B.D.

12. (a) Write the Analysis of 2^3 – Factorial Experiment.

(Or)

(b) Write the Analysis of 3^2 – Factorial Experiment.

13. (a) Explain the Analysis of Balanced Incomplete Block Design.

(Or)

(b) Explain the Analysis of Partially Incomplete Block Design.

# # #

Model Questions Paper

III B.Sc., Degree Examination (at the end of VI Semester)

STATISTICS-Elective Paper

(With Mathematics Combination)

Paper – VII – B: Optimization Techniques

(With effect from 2015-2016 admitted Batch)

Time: 3Hours **Max. Marks: 75 M**

PART: A

Answer any FIVE questions **5 x 5 = 25 M**

1. Explain origin and development of Operations Research.
2. Write the mathematical formulation of L.P.P.
3. Explain basic feasible solution and optimum basic feasible solution.
4. Explain problem of Degeneracy in L.P.P.
5. Explain general primal – dual pair.
6. Write the scientific method in Operations Research.
7. Write the standard Form of L.P.P.
8. Define slack and surplus variables.

PART: B

Answer ALL the following questions **5 x 10 = 50 M**

9. (a) Explain General Solution Methods for O.R. Models.

(Or)

(b) Explain Nature and Features of O.R.

10. (a) Write the major steps in graphical solution method.

(Or)

(b) Solving the following L.P.P. by Graphically

$$Maximize\ Z = 10x_1 + 6x_2$$

Subject tothe Constraints $5x_1 + 3x_2 \leq 30,\ x_1 + 2x_2 \leq 18, and\ x_1, x_2 \geq 0$

11. (a) Explain Simplex Algorithm.

(Or)

(b) Solve the following L.P.P. by Simplex Method.

$$Maximize\ Z = 4x_1 + 10x_2$$

Subject to the Constraints $2x_1 + x_2 \leq 50$

$$2x_1 + 5x_2 \leq 100$$

$$2x_1 + 3x_2 \leq 90 and\ x_1, x_2 \geq 0$$

12. (a) Explain procedure of Big-M Method.

(Or)

(b) Solve the following problem by Big-M Method.

$$Maximize\ Z = 6x_1 + 4x_2$$

Subject to the Constraints $2x_1 + 3x_2 \leq 30$

$$3x_1 + 2x_2 \leq 24$$

$$x_1 + x_2 \geq 3 and x_1, x_2 \geq 0$$

13. (a) Explain various steps involved in formulating a dual problem.

(Or)

(b)Use duality to solve the following L.P.P.

$$Maximize\ Z = 2x_1 + x_2$$

Subject to the Constraints $x_1 + 2x_2 \leq 10$

$$x_1 + x_2 \leq 6$$

$$x_1 - x_2 \leq 2$$

$$x_1 - 2x_2 \leq 1 and\ x_1, x_2 \geq 0$$

# # #

Model Questions Paper

III B.Sc., Degree Examination (at the end of VI Semester)
STATISTICS
(With Mathematics Combination)
Cluster –B: Paper – VIII - B1: Operations Research – I
(With effect from 2015-2016 admitted Batch)

Time: 3Hours **Max. Marks: 75 M**

PART: A

Answer any FIVE questions **5 x 5 = 25 M**

1. Explain bounded variables.
2. Write the tabular representation of transportation problem.
3. Explain briefly degeneracy transportation problem.
4. Explain travelling salesman problem.
5. Write the assumptions of sequencing problem.
6. Determine an initial basic feasible solution to the following transportation problem using North-West Corner Method.

	D1	D2	D3	D4	Availability
O1	5	3	6	2	19
O2	4	7	9	1	37
O3	3	4	7	5	34
Demand	16	18	31	25	

7. Solve the following assignment problem.

	A	B	C	D
I	1	4	6	3
II	9	7	10	9
III	4	5	11	7
IV	8	7	8	5

8. We have five jobs, each of which must go through the two machines A and B in the order AB. Processing times in hours are given in the table below.

Job	1	2	3	4	5
Machine A	5	1	9	3	10
Machine B	2	6	7	8	4

Determine a sequence for the five jobs that will minimize the elapsed time.

PART: B

Answer ALL the following questions **5 x 10 = 50 M**

9. (a) Explain Revised Simplex Algorithm.

(Or)

(b) Use revised simplex method to solve the following L.P.P.

$$Minimize\ Z = x_1 + 4x_2$$

Subjective Constraints $x_1 + 2x_2 \leq 7$

$$4x_1 + x_2 \leq 6 and\ x_1, x_2 \geq 0$$

10. (a) Explain least cost method.

(Or)

(b) Determine an initial basic feasible solution to the following transportation problem by using the VAM-Method.

	I	II	III	IV	Supply
A	13	11	15	20	2000
B	17	14	12	13	6000
C	18	18	15	12	7000
Demand	3000	3000	4000	5000	

11. (a) Explain MODI method.

(Or)

(b) Find the optimum solution to the following problem using UV-Method.

		Destination				Supply
		I	II	III	IV	
SOURCE	O_1	21	16	25	13	11
	O_2	17	18	14	23	13
	O_3	32	17	18	41	19
Demand		6	10	12	15	43

12. (a) Explain an algorithm to solve Assignment Problem by Hungarian method.

(Or)

(b) Solve the following assignment problem of maximization.

Employee	JOBS				
	I	II	III	IV	V
A	10	5	13	15	16
B	3	9	18	13	6
C	10	7	2	2	2
D	7	11	9	7	12
E	7	9	10	4	12

13. (a) Explain sequential procedure for solving 2 machines 'n' jobs problem.

(Or)

(b) Determine the optimal sequence of jobs that minimizes the total elapsed time based on the following information processing time on machines is given in hours and passing is not allowed.

Job	A	B	C	D	E	F	G
Machine M_1	3	8	7	4	9	8	7
Machine M_2	4	3	2	5	1	4	3
Machine M_3	6	7	5	11	5	6	12

# # #

Model Questions Paper

III B.Sc., Degree Examination (at the end of VI Semester)

STATISTICS

(With Mathematics Combination)

Cluster –B: Paper – VIII - B2: Operations Research – II

(With effect from 2015-2016 admitted Batch)

Time: 3Hours **Max. Marks: 75 M**

PART: A

Answer any FIVE questions **5 x 5 = 25 M**

1. Describe Game and Strategy.
2. Explain Economic Order Quantity.
3. Explain EOQ Problem with one price break.
4. Write the factors affecting inventory control
5. Explain Logical Sequencing in networking.
6. Write the applications of network techniques.
7. Find the Saddle Point of the followingpayoff matrix.

		Player B		
		B1	B2	B3
	A1	60	56	34
Player A	A2	63	60	55
	A3	83	72	60

8. Develop a network diagram for the project specified below.

Activity	A	B	C,D	E	F	G
Immediate Predecessor Activity	-	A	B	C	D	E,F

PART: B

Answer ALL the following questions **5 x 10 = 50 M**

9. (a) Explain the graphical method of solving 2 x n game.

(Or)

(b) Solve the following game using the method of dominance.

		Player B			
		B1	B2	B3	B4
Player A	A1	4	2	3	6
	A2	3	4	7	5
	A3	6	3	5	4

10. (a) Describe deterministic inventory problems.

(Or)

(b) A manufacturing company purchases 9,000 parts of a machine for its annual requirements, ordering one month usage at a time. Each part costs Rs.20. The ordering cost per order is Rs.15 and the carrying charges are 15% of the average inventory per year. You have been assigned to suggest a more economical purchasing policy for the company. What advice would you offer and how much would it save the company per year?

11. (a)Explain Probabilistic Inventory Single Period Problem without set-up cost.

(Or)

(b) The probability distribution of monthly sales of a certain item is as follows:

Monthly sales:	0	1	2	3	4	5	6
Probability	0.02	0.05	0.30	0.27	0.20	0.10	0.06

The cost of carrying inventory is Rs.10 per unit per month. The current policy is to maintain a stock of four items at the beginning of each month. Assuming that the cost of shortage is proportional to both time and quantity short, obtain the imputed cost of a shortage of one item for one unit of time.

12. (a) Describe the rules of network construction.

(Or)

(b) The following details are available regarding a project

Activity	A	B	C	D	E	F
Predecessor Activity	-	A	A	B	C	D, E
Duration (Week)	3	5	7	10	5	4

Draw the network, determine the Critical Path and find the project completion time.

13. (a) Explain the difference between PERT and CPM.

(Or)

(b) Determination of project completion time in PERT. Find out the time required to complete the following project and the critical activities.

Activity	A	B	C	D	E	F	G	H	I
Predecessor Activity	-	A	A	B	C	D,E	D,E	F	G
Pessimistic Time	6	9	12	15	10	26	25	8	5
Optimistic Time	2	3	8	9	8	16	19	2	1
Most likely Time	4	6	10	12	9	21	22	5	3

# # #