

Nizam College (Autonomous)  
Faculty of Science  
B.SC. I- Semester Examinations, January - 2023  
Statistics : Paper - I

Max. Marks : 80

Time : 3 Hours

Section – A

[8 x 4 = 32]

I. Answer any EIGHT of the following questions.

1. Write about types of data
2. Write about Sheppards corrections
3. Write about Kurtosis
4. Define Mutually exclusive and exhaustive events
5. Give the Axiomatic definition of probability
6. State and prove addition theorem of probability for 2 events
7. Define discrete and continuous random variables
8. Write about bi variate random variable
9. Define marginal and conditional distributions
10. Define Mathematical expectation
11. Write about Cauchy Schwartz's inequality
12. Define Characteristic function

Section – B

[4 x 12 = 48]

II. Answer the following questions using internal choice.

13. (a) Explain various methods of collecting data.

[OR]

(b) Express Central moments in terms of Non central moments.

14. (a) State and prove Boole's inequality.

[OR]

(b) State and prove Addition theorem of probability for n events.

15. (a) Write the Probability distribution of sum of the faces when two dice are rolled also find its mean and variance.

[OR]

(b) Joint probability density function of X and Y is

$$f(x,y) = \frac{6-x-y}{8}; 0 < x < 2, 2 < y < 4.$$

Find mean and variances of X and Y.

- (a) Define Moment generating function and state and prove its properties.

[OR]

(b) State and prove Chebyshev's inequality.

Nizam College (Autonomous)  
Faculty of Science  
B.SC. I- Semester Examinations, May - 2023  
Statistics : Paper - 1

Code No. 23M107/NC/STAT

Time : 3 Hours

Section – A

Max. Marks : 80

I. Answer any EIGHT of the following questions.

[8 x 4 = 32]

1. Write about Classification
2. Write about Sheppards corrections
3. Define central and non central moments
4. Define Mutually exclusive and equally likely events
5. Give the Axiomatic definition of probability
6. State the Bayes' theorem
7. Define discrete and continuous random variables
8. Write about bi variate random variable
9. Define probability mass function and probability density function
10. Define Mathematical expectation
11. Write about Cauchy Schwartz's inequality
12. Define cumulant generating function

Section – B

II. Answer the following questions using internal choice.

[4 x 12 = 48]

13. (a) Write about absolute and relative measures of dispersion.

[OR]

- (b) Express Central moments in terms of Non central moments.

14. (a) State and prove Boole's inequality.

[OR]

- (b) State and prove Addition theorem of probability for n events.

15. (a) Write the Probability distribution of sum of the faces when two dice are rolled also find its mean and variance.

[OR]

- (b) Define Distribution function and prove its properties.

16. (a) Obtain MGF and four moments of the distribution  $f(x)=ce^{-x}$ ; where c is a positive constant and  $x>0$ .

[OR]

- (b) State and prove Chebyshev's inequality.

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Nizam College (Autonomous)  
Faculty of Science  
B.SC. I- Semester Examinations, December - 2023  
Statistics : Paper – I

Time : 3 Hours

Max. Marks : 80

Section – A

I. Answer any EIGHT of the following questions.

[8 x 4 = 32]

1. Define primary data. Explain methods of collecting it.
2. Define Dispersion. Write the formulas for measures of dispersion
3. Kurtosis
4. Definition of classical probability
5. Conditional event & Conditional probability
6. Mutually Exclusive events & equally likely events
7. Probability density function
8. Define transformation of one-dimensional random variable
9. Marginal probability function
10. Prove that  $E(XY) = E(X)E(Y)$  for  $X$  and  $Y$  are independent.
11. Properties of Characteristics function
12. Statement of Cauchy Schwartz Inequality

Section – B

II. Answer the following questions.

[4 x 12 = 48]

13. (a) Show that for a discrete distribution
- $\beta_2 > 1$

[OR]

- (b) Explain Karl Pearson coefficient of Skewness.

If mean = 56.36 mode = 55.38 SD = 17.84 find Karl Pearson's skewness

14. (a) (i) Explain Axiomatic definition of probability.

(ii) If  $A$  and  $B$  are independent, show that  $\bar{A}$  and  $\bar{B}$  are also independent.

[OR]

- (b) State and prove Addition theorem of probability for
- $n$
- events.

15. (a) Explain discrete and continuous random variable with examples.

A r.v  $X$  has the following distribution. Find 'k', and hence find mean.

x	-2	-1	0	1	2	3
p(x)	0.1	k	0.2	2k	0.3	k

[OR]

- (b) For the following density function

 $f(x) = 3x^2$   $0 < x < 1$  Find (i) mean and variance.

16. (a) State and prove Chebyshev's inequality.

[OR]

- (b) Define Moment generating function. Explain its properties. How do you generate moments from m.g.f.?

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NIZAM COLLEGE (AUTONOMOUS)  
 FACULTY OF SCIENCE  
 B.SC. II- SEMESTER EXAMINATIONS, MAY – 2023  
 STATISTICS : PAPER - 2  
 (PROBABILITY DISTRIBUTIONS)

Time : 3 Hours

Max. Marks : 80

SECTION – A

I. Answer any EIGHT of the following questions.

[8 x 4 = 32]

1. Explain Poisson Distribution and derive its mean and variance.
2. Explain the properties of Binomial distribution.
3. Define uniform distribution, derive its variance.
4. Explain properties of Negative binomial distribution.
5. Define hyper geometric distribution, derive its mean.
6. What is the reproductive property in case of Binomial distribution.
7. List out moments of Normal distribution.
8. If X is a normal variate with mean 30 and variance 25, find the probability that  $26 \leq X \leq 40$ . (Give only expression).
9. Define Normal distribution, derive its mean.
10. What is the mean of Beta distribution II-kind?
11. Define Rectangular distribution. Derive its variance.
12. Probability generating function of Exponential distribution.

SECTION – B

II. Answer the following questions.

[4 x 12 = 48]

13. (a) Derive Raw moments of Poisson Distribution.  
 [OR]  
 (b) Define Bernoulli Distribution. Derive Mean, Mode of Binomial Distribution.
14. (a) Derive MGF, CGF, PGF of Geometric Distribution  
 [OR]  
 (b) Explain Poisson as approximation to Negative binomial distribution.
15. (a) Prove Mean = Median = Mode in Normal distribution.  
 [OR]  
 (b) Derive S.D, M.D in case of normal distribution.
16. (a) Derive Raw moments of Gamma distribution.  
 [OR]  
 (b) Write about Beta distribution of I kind and II kind. Derive mean of Beta-I.

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Set-2

Code No. 23J307/NC /STAT

Nizam College (Autonomous)  
Faculty of Science

B.SC. III- Semester Examinations, January - 2023

Statistics : Paper – III

(Statistical Methods and Theory of Estimation)

Time : 3 Hours

Max. Marks : 80

Section – A

I. Answer any EIGHT of the following questions.

[8 x 4 = 32]

1. Define Bivariate data.
2. Define rank correlation coefficient.
3. What is regression analysis?
4. Define the partial correlation coefficient.
5. Write short notes on the association of attributes.
6. Define the coefficient of colligation.
7. Define: (i) Parameter (ii) Statistic (iii) Standard error.
8. Define t distribution and write its applications.
9. Define consistency.
10. Write short notes on estimation by method of moments.
11. State asymptotic properties of MLE.
12. Define confidence intervals by the Pivot method for a normal population.

Section – B

II. Answer the following questions using internal choice.

[4 x 12 = 48]

13. (a) Define Karl Pearson's coefficient of correlation. Also give its formula and derive its limits.

[OR]

(b) What is curve fitting? Fit a straight line by using the principle of least squares.

14. (a) Explain in detail about the independence of attributes.

[OR]

(b) Show that  $Q = \frac{2Y}{1+Y^2}$ .

15. (a) Explain F distribution with properties and applications.

[OR]

(b) Explain Point estimation in detail and also explain the concept of bias and mean square error of an estimate.

16. (a) Derive sufficient statistic of Poisson distribution.

[OR]

(b) Explain the method of Maximum Likelihood Estimation.

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CODE NO. 23M307/NC/STAT

Nizam College (Autonomous)  
Faculty of Science  
B.SC. III- Semester Examinations, May - 2023  
Statistics : Paper – III  
(Statistical Methods and Theory of Estimation)

Time : 3 Hours

Max. Marks : 80

Section – A

I. Answer any EIGHT of the following questions.

[8 x 4 = 32]

1. Explain principle of least squares.
2. Define correlation coefficient.
3. Show that the regression coefficients are independent of change of origin but not of scale.
4. Define categorical data.
5. Explain the independence of attributes.
6. Explain Yule's coefficient of association for two-way data.
7. Define: (i) Population (ii) Sample.
8. Define  $\chi^2$  distribution and write its applications.
9. Explain the concept of unbiasedness.
10. State Neyman's Factorization theorem.
11. What is interval estimation?
12. Define likelihood Function.

Section – B

II. Answer the following questions using internal choice.

[4 x 12 = 48]

13. (a) State and prove the properties of correlation coefficients.

[OR]

(b) Derive the lines of regression of Y on X and X on Y.

14. (a) Explain partial and multiple correlation coefficients with properties.

[OR]

(b) Explain the coefficients of contingency and colligation.

15. (a) Explain t distribution with properties and applications.

[OR]

(b) Explain the criteria of a good estimator.

16. (a) Derive sufficient statistics for Normal distribution.

[OR]

(b) Explain the estimation by method of moments and find the moment estimator in case of poisson distribution.

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Nizam College (Autonomous)  
Faculty of Science  
B.SC. III- Semester Examinations, December - 2023  
Microbiology : Paper – III  
(Food and Environmental Microbiology)

Time: 3 Hours

Max. Marks: 80

Section – A

*I. Answer any EIGHT of the following questions.*

[8 x 4 = 32]

1. Microflora of Fermented food- Idly
2. Prebiotic
3. Significance of Dairy microorganisms
4. Food irradiation
5. Importance of quality control in Food industry
6. Microorganisms of Food spoilage
7. Water borne pathogens
8. Trickling filter
9. Indicator Microorganisms
10. Phyllosphere
11. Bioremediation
12. PGPR

Section – B

*II. Answer the following questions.*

[4 x 12 = 48]

13. (a) What is the name of fermented vegetable made of cabbage? Explain the process of fermentation and its health benefits.

[OR]

- (b) Explain the process of cheese preparation, highlighting the steps involved, add a note on types of chesses available.

14. (a) Define Mycotoxins. Explain various types of mycotoxins and their toxicity.

[OR]

- (b) Describe the methods used to detect the pathogens in food.

15. (a) Give a detailed discussion on airborne microorganisms and elaborate on their roles and significance in the environment.

[OR]

- (b) What are the organic water pollutants and how do they contribute to water body pollution?

16. (a) What is mycorrhizae. Explain various types of Mycorrhizae and their significance in plant growth.

[OR]

- (b) Describe the steps of the Carbon cycle using a schematic diagram? Add a note on the importance of microbes in facilitating the nitrogen cycle.

NIZAM COLLEGE (AUTONOMOUS)  
FACULTY OF SCIENCE

B.SC. IV- SEMESTER EXAMINATIONS, MAY – 2023

STATISTICS : PAPER - IV

Time : 3 Hours

Max. Marks : 80

Section – A

Answer any EIGHT of the following questions.

[8 x 4 = 32]

1. Define Null and Alternative hypotheses and power of the test.
2. Define critical region, level of significance?
3. State Neyman-Pearson lemma?
4. Explain the Procedure for testing of Hypothesis.
5. Explain large sample test for single Proportion?
6. A correlation coefficient of 0.76 is obtained from a sample of 69 pairs of observations. Can the sample be regarded as drawn from a bivariate normal population in which the true correlation coefficient is 0.8 ?
7. Explain the t-test for correlation coefficient.
8. Explain the test procedure for testing population variance?
9. Explain the Chi-square test for goodness of fit?
10. Define Nominal and Ordinal scale of measurement with examples?
11. Explain the one sample Run test? .
12. Explain the advantages of Non parametric tests?

SECTION – B

Answer the following questions using internal choice.

[4 x 12 = 48]

13. (a) Define Most Powerful test ? Obtain the Most Powerful Test for testing  $H_0 : \theta = \theta_0$  against  $H_1 : \theta = \theta_1$  in case of a random sample  $x_1, x_2, \dots, x_n$  from the exponential population

[OR]

- (b) Define Type I and Type II errors?

A coin is tossed 6 times and the hypothesis  $H_0 : p = \frac{1}{2}$  is rejected if the number of heads is greater than 4. Find the sizes of Type I and Type II errors if the alternative hypothesis

$$H_1 : p = \frac{1}{4} \quad \text{Also find power?}$$

14. (a) (i) Describe the large sample test procedure for testing the significance of correlation coefficient.  
(ii) A machine in a certain factory must be repaired if it produces more than 15% Defectives among the large lot of items it produces in a week. A random sample of 195 items from a week's production contains 55 defectives, and it is decided that the machine must be repaired. Does the sample evidence support this decision?

[OR]

- (b) (i) Describe the large sample test procedure for testing the difference between Proportions.  
(ii) In a study to estimate the proportion of residents in a certain city and its suburbs who favor the construction of a nuclear power plant, it is found that 63 of 100 urban residents favor the construction while only 59 of 125 suburban residents are in favor. Is there a significant difference between the proportions of urban and suburban residents who favor construction of the nuclear plant?

[P.T.O]



15. (a) (i) Explain the small sample test procedure for testing the difference of means in case of Dependent samples?

(ii) The mean weekly sales of soap bars in departmental stores was 146.3 bars per store. After advertising campaign the mean weekly sales in 22 stores for a typical week increased to 153.7 and showed a standard deviation of 17.2 . Was the advertising campaign successful?

[OR]

(b) Explain the Chi-Square test for independence of attributes? Explain Yates correction for Continuity?

16. (a) Distinguish between Non-parametric tests and parametric tests? Explain the procedure of Wilcoxon sign rank test for two samples?

[OR]

(b) (i) Explain the Wilcoxon – Mann Whitney U test procedure?

(ii) To compare the variability of two brands of tyres, the following mileages ('000 miles) obtained.?

Brand A	55	57	72	90	57	74	
Brand B	80	76	63	58	56	37	75

Test the null hypothesis that the two samples come from same population using Mann Whitney U-test. (Table value :13)

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Nizam College (Autonomous)  
Faculty of Science  
B.SC. V- Semester Examinations, January - 2023  
Statistics : Paper – V

Time : 3 Hours

Max. Marks : 80

Section – AI. Answer any **EIGHT** of the following questions.

[8 x 4 = 32]

1. Give the importance of Sampling
2. Define Sampling distribution and standard error
3. Write about judgment sampling
4. Write about various allocations of sample size in stratified sampling
5. Define systematic sampling
6. Define Cost function
7. Write about decomposition of time series
8. Write about seasonal variation
9. Write about logistic curve
10. Explain 3 sigma control limits
11. Write about process control and product control
12. Write the applications of c chart

Section – B

II. Answer the following questions using internal choice.

[4 x 12 = 48]

13. (a) What are the principal steps involved in sample surveys

[OR]

(b) Derive variance of sample mean in simple random sampling without replacement.

14. (a) Explain Stratified random sampling along with its advantages.

[OR]

(b) Compare the three sampling techniques when the population consists of a linear trend

15. (a) Define Time series and explain Ratio to trend method

[OR]

(b) Compute 3 yearly and 5 yearly moving averages for the following data

Year: 1	2	3	4	5	6	7	8	9	10	11	12
Values: 220	208	156	210	240	238	220	228	244	254	244	260

16. (a) Give the importance of SQC in industry

[OR]

(b) Explain the construction of control chart for fraction defective for variable sample size

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CODE NO: 23ME607/NC/STA-6-B/L

**NIZAM COLLEGE (AUTONOMOUS)**  
**FACULTY OF SCIENCE**  
**B.SC. V-SEMESTER EXAMINATION MAY-2023**  
**STATISTICS: PAPER-6**

[TIME: 2 HOURS]

[MAX. MARKS 40]

**SECTION-A**  
(Short Answer Questions)

[4 × 3 = 12]

1. Explain slack and surplus variables with example.
2. Define a) Transportation problem  
b) Unbalanced Transportation problem
3. Explain special cases in assignment problem.
4. Mention the activities of NSSO.

**SECTION-B**  
(Essay Answer Questions)

[4 × 7 = 28]

5. a) Define General Linear Programming problem and explain the steps involved in Simplex Method.

(OR)

- b) Explain the concept of Duality and Primal, Dual Relationships with an example.

6. a) Explain Stepping Stone method of obtaining optimum solution in a transportation problem.

(OR)

- b) What is degeneracy in Transportation Problem and explain the method to resolve degeneracy in Transportation Problem.

7. a) Explain the Steps involved in Hungarian Method of solving the assignment problem.

(OR)

- b) Give Johnson's procedure for determining an optimal sequence for processing n jobs and three machines.

8. a) Explain measures of Mortality.

(OR)

- b) Define a National Income. What are the uses of National Income estimates?

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CODE: 23M5507/NC/CBCS/STAT-5

Nizam College (Autonomous)  
Faculty of Science  
B.Sc. V – Semester Examinations May - 2023  
Statistics: Paper – V

[Time: 2 Hours]

[Marks: 40]

SECTION A

(Short Answer Questions)

(4x3=12)

1. Give the principles of Sample survey
2. What is Stratified random sampling
3. Define Systematic sampling give its merits and demerits
4. Explain Seasonal variation.

SECTION B

(Essay Questions)

(4x7=28)

5. a) Describe about Sampling and Non sampling Errors.

(OR)

b) In SRSWOR prove that sample mean square is an unbiased estimate of Population mean square.

6. a) Show that  $\text{Var}(\bar{y}_{st})$  is minimum for fixed total size of the sample(n) if  $n_i \propto N_i S_i$ .

(OR)

b) Compare Stratified sampling with simple random sampling in terms of variance of sample mean.

7. a) Obtain the variance of sample mean under Systematic sampling.

(OR)

b) Compare Simple random sampling, Stratified sampling and Systematic sampling.

8. a) Explain the method of Ratio to Moving averages.

(OR)

b) Explain any two methods to find Trend.

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Nizam College (Autonomous)

Faculty of Science

B.SC. V- Semester Examinations, December - 2023

Statistics : Paper – V

(Applied Statistics – I (V(A)))

Time : 3 Hours

Max. Marks : 80

Section – A

I. Answer any EIGHT of the following questions.

[8 x 4 = 32]

1. Define sample, statistic and sampling unit.
2. What are the sources of non-sampling errors.
3. Explain mechanical and manual randomization method for selecting a simple random sample.
4. Obtain variance of stratified sample mean in proportional allocation.
5. In stratified sampling optimum allocation, prove that  $v(\bar{y}_{st})$  is minimum for fixed total sample size  $n$  if  $n_i \propto N_i S_i$ .
6. Define systematic sampling.
7. Define time series. What are the uses of time series.
8. Explain method of semi average for measuring trend.
9. Explain ratio to moving average method for measuring seasonal indices.
10. Explain causes of variation.
11. What are the applications of c-chart.
12. Explain control charts.

Section – B

[4 x 12 = 48]

II. Answer the following questions.

13. (a) (i) What are the advantages of sampling over census?  
(ii) In SRSWOR, show that sample mean is an unbiased estimate of population mean.  
[OR]
- (b) In SRSWOR, show that  $V(\bar{y}_n) = \frac{N-n}{Nn} S^2$ . Also show that  $V(\bar{y}_n)_{SRSWOR} < V(\bar{y}_n)_{SRSWR}$ .
14. (a) (i) Define stratified random sampling. What are the advantages?  
(ii) Explain allocation of sample size in stratified sampling.  
[OR]
- (b) With the usual notations, Prove that  $V(\bar{y}_{st})_{opt} \leq V(\bar{y}_{st})_{prop} \leq V(\bar{y}_n)_{ran}$ .
15. (a) Explain components of time series and give examples?  
[OR]
- (b. Explain fitting of modified exponential curve using three selected points method.
16. (a) Define SQC. Explain construction of control limits for fraction defectives chart for constant and verifying sample sizes.  
[OR]
- (b) Explain construction of control limits for mean and standard deviation chart state how do you interpret them.

CODE NO. 23D/507/NC /STAT

Nizam College (Autonomous)  
Faculty of Science  
B.SC. V- Semester Examinations, December - 2023  
Statistics : Paper – V  
(Analytical Statistics V(B))

Time : 3 Hours

Max. Marks : 80

Section – A

I. Answer any EIGHT of the following questions.

[8 x 4 = 32]

1. Mention the limitation of sampling.
2. Define stratified random sampling and mention its uses.
3. Define SRSWOR. P.T sample mean is an unbiased estimator of population mean
4. Mention merits and demerits of curve fitting by principles of least squares.
5. Mention any FOUR uses of time series.
6. Explain method of simple average.
7. Explain assignable and chance causes of variation
8. Explain the term local control.
9. State the assumption in Gauss- Markoff linear model.
10. Mention the uses of SQC.
11. Explain the terms product control and process control.
12. Mention the merits and demerits of CRD.

Section – B

II. Answer the following questions.

[4 x 12 = 48]

13. (a) With the usual notion P.T in SRSWOR  $\text{Var}(\bar{y}_n) = ((N-n)/N) \cdot (S^2/n)$   
[OR]  
(b) What are principle steps involved in conducting a sample survey.
14. (a) Define time series? Explain the components of time series.  
[OR]  
(b) Explain link relative method to determine seasonal indices.
15. (a) Derive statistical analysis of one way Classification  
[OR]  
(b) Define RBD .What is missing plot technique of RBD.
16. (a) What are control charts.? How do you construct mean and range charts.  
[OR]  
(b) How do you construct c charts and what are applications of c charts.

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CODE NO. 23M607/NG/STAT

NIZAM COLLEGE (AUTONOMOUS)  
 FACULTY OF SCIENCE  
 B.SC. VI- SEMESTER EXAMINATIONS, MAY - 2023  
 STATISTICS - PAPER - VI  
 (APPLIED STATISTICS-II)

Time : 3 Hours

Max. Marks : 80

SECTION - A

I. Answer any **EIGHT** of the following questions.

[8 x 4 = 32]

1. Define Cochran's theorem.
2. Write the assumptions of ANOVA.
3. How correction factor is calculated? Explain where it is used in ANOVA
4. Give the statistical ANOVA table for Latin square design.
5. Derive the formula for one missing plot in R.B.D
6. How is the efficiency of a design measured?
7. Define net production rate (NRR)
8. Write uses of life table.
9. Explain briefly various measures of mortality.
10. Explain the function of CSO.
11. Explain deflation of index numbers.
12. Show that Fisher Index number is an ideal index number.

SECTION - B

II. Answer the following questions using internal choice.

[4 x 12 = 48]

13. (a) What is two-way classification with one observation per cell in ANOVA? Explain  
[OR]  
(b) Obtain the expectations of various sum of squares in the analysis of variance for one-way classification.
14. (a) Describe the following three fundamental principles. Explain how these principles have been observed in R.B.D  
I) Randomization II) Replication III) Local control  
[OR]  
(b) What is LSD? Give the Assumptions and Analysis of Latin Square Design.

15. (a) Complete the life table for the following data

Age (x)	0	40	60	70	80	90	100
$l_x$	1000	920	782	528	252	14	0

[OR]

(b) Explain the various measures of fertility rates in vital statistics.

16. (a) What is national income and how it is computed? What are the utilities and difficulties in availing it?

[OR]

(b) Explain the concept of criteria of a good index number. State the advantages of index numbers.

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CODE NO: 23M6707/NC/STA-7(B/L)

NIZAM COLLEGE (AUTONOMOUS)  
FACULTY OF SCIENCE  
B.SC. VI-SEMESTER EXAMINATIONS MAY - 2023  
STATISTICS: PAPER -7  
(Design of Experiments and Index Numbers)

[TIME: 2 HOURS]

[Max. Marks : 40]

I. Answer all the questions.

SECTION-A

1. What is the importance of Design of Experiments?
2. Explain expectation of treatment sum of squares in one way data.
3. What are the factorial experiment?
4. Define index numbers. What are the uses of constructing them?

[4x3=12]

SECTION-B

II. Answer the following questions using internal choice.

[4x7=28]

5. (a) Write in detail about Gauss Markov linear model.  
[OR]  
(b) Explain the statistical analysis of ANOVA two-way classification.
6. (a) Derive expectation of various sum of squares in Randomised Block Design.  
[OR]  
(b) Obtain the efficiency of RBD relative to CRD and LSD relative to RBD.
7. (a) Explain missing plot technique in LSD with two unknown observations.  
[OR]  
(b) Explain statistical analysis of  $2^2$ - design.
8. (a) Define Fisher's price index number and quantity index number. Prove how Fisher index is an ideal index.  
[OR]  
(b) Write the uses and limitations of index numbers.

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NIZAM COLLEGE (AUTONOMOUS)  
FACULTY OF SCIENCE  
B.Sc. VI-SEMESTER EXAMINATIONS MAY-2023  
STATISTICS : PAPER -8

TIME: 2 HOURS]

MAX. MARKS=40]

SECTION-A

I. ANSWER THE FOLLOWING QUESTIONS

[4x3=12]

1. What is elasticity of supply?
2. Define Gini's coefficient.
3. Explain the concept of quality control. How quality control is useful in industry?
4. Define: LTPD, Producer's risk and Consumer's risk.

SECTION-B

II. ANSWER THE FOLLOWING QUESTIONS USING INTERNAL CHOICE

[4x7=28]

5. (a) Explain Demand Analysis and demand, supply curves.  
(OR)
- (b) Define elasticity of demand. If the demand function is  $p = 5 - 3x^2$  for what value of  $x$  the elasticity of demand is unitary.
6. (a) Define Pareto's law of income distribution; explain its properties and applications.  
(OR)

(b) Describe Pigou's method for time series data and give its limitations.

7. (a) Construct control charts of Mean, Range for the following data on the basis of fuses, samples of 5 being taken every hour. [ $A_2 = 0.577$ ,  $D_3 = 0$ ,  $D_4 = 2.115$ ]

8.	42	42	19	36	42	51	60	18	15	69	64	61
9.	65	45	24	54	51	74	60	20	30	109	90	78
10.	75	68	80	69	57	75	72	27	39	113	93	94
11.	78	72	81	77	59	78	95	42	62	118	109	109
12.	87	90	81	84	78	132	138	60	84	153	112	136

(OR)

(b) Explain the construction procedure of  $p$ ,  $np$  and  $c$ - charts.

8. (a) Explain determination of  $n$  and  $c$  in case of single sampling plans. What is the Binomial approximation?

(OR)

(b) What is reliability? Derive reliability function  $R(t)$ .

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