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S.B.ARTS AND K.C.P SCIENCE COLLEGE,

VIJAYAPUR

DEPARTMENT OF STATISTICS

IA EVEN SEMESTER QUESTION PAPERS

2023-24

B. L. D. E. Association's

S. B. ARTS AND K. C. P. SCIENCE COLLEGE, VIJAYAPUR

DEPARTMENT OF STATISTICS

First/~~Second~~ Internal Assessment -2023-24

Semester: B.Sc.-II (DSC)	Subject: Probability and Distributions	Code:
Date: 10/07/2024	Time: 9.30 am -10.30 am	Max. Marks: 30

Q. No. I. **Answer any Five of the following Questions.** **5×2=10**

a) Define Conditional Probability?

b) Prove that $P(A^1)=1-P(A)$

c) What do you mean by P.M.F

d) State addition theorem of Probability.

e) Define Random variable.

f)

X	1	3	5	7	10
P(X)	k	4k	3k	k	2k

Find the value of k.

Q. No II **Answer any Two of the following Questions.** **2×5=10**

a) State and Prove Multiplication Theorem.

b) If X is a r.v. a and b are constant then Prove that i) $E(ax+b)=aE(x)+b$

ii) $V(ax+b)= a^2 . V(x)$

c) Two cards are drawn from a pack of 52 cards. What is the probability that they are

i) King ii) Hearts.

Q. No. III **Answer any One of the following Question.** **1×10=10**

a) i) State and Prove Baye's Theorem.

b) Find the value of k for the following probability density function and hence find mean.

$f(x)= k(x+4)/8 \quad 0<x<4$

$0 \quad o.w$

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DEPARTMENT OF STATISTICS

First/~~Second~~ Internal Assessment -2023-24

Semester: BSc-IV	Subject: STATISTICAL INFERRENCE-I	Code:
Date: 11/07/2024	Time: 9.30 to 10.30	Max. Marks: 30

Q. No. I.	**Answer any Five of the following Questions.**	**5×2=10**
a)	Define order Statistics.	
b)	Define Parameter and Statistic.	
c)	Define Estimator and Estimate..	
d)	State Cramer Rao Inequality.	
e)	Define Consistent estimator	
f)	State properties of MLE.	
Q. No II	**Answer any Two of the following Questions.**	**2×5=10**
a)	If T is consistent estimator for θ then show that T^2 is a consistent estimator for θ^2	
b)	Obtain the pdf of $X_{(n)}$ n^{th} order statistics.	
c)	Find the Sufficient statistics for θ in $f(x, \theta) = e^{-\theta}\theta^x/x!$	
d)	If $X_1, X_2, \ldots, X_n$ is a random sample from $N(0,\sigma^2)$ distribution then show that $1/n\sum x_i^2$ Is an unbiased estimator of σ^2.	
Q. No. III	**Answer any One of the following Question.**	**1×10=10**
a)	State and prove Neyman –Factorization theorem.	
b)	Define MVUE. If $X_1, X_2, \ldots, X_n$ is a random sample from Poisson distribution with parameter μ.Show that sample mean and sample variance are unbiased estimator of μ	

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DEPARTMENT OF STATISTICS

First/~~Second~~ Internal Assessment -2023-24

Semester: B.Sc.-VI (DSC) P-I	Subject: Statistical Inference- II	Code:
Date: 9/07/2024	Time: 1.40 pm -2.30 pm	Max. Marks: 30

Q. No. I.	Answer any Five of the following Questions.	5×2=10
1	Define UMP test.	
2	Write the conditions of SPRT	
3	Define LRT.	
4	Define ASN function.	
5	Define OC function	
6	Write the pdf of normal distribution ifs mean 0 and Variance σ^2.	
Q. No II	Answer any Two of the following Questions.	2×5=10
7	Likelihood Ratio Test for the variance of N.D	
8	Let $X_1, X_2, X_3 \ldots, X_n$ be a random sample from the exponential distribution with parameter θ Obtain UMP test for testing of hypothesis $H_0: \theta \leq \theta_0$ v/s $H_1: \theta > \theta_1$	
9	S.T Cauchy C(0, θ)has not follow MLR property.	
Q. No. III	Answer any One of the following Question.	1×10=10
10	Let $X_1, X_2, X_3 \ldots, X_n$ be a random sample from $F(x/\theta)= \theta x^{\theta-1}$ $0<x<1$ $\theta>0$ Find UMP test of size $\alpha$for testing of hypothesis $H_0: \theta \leq \theta_0$ v/s $H_1: \theta > \theta_1$	
11	Construct SPRT and Obtain its OC function for Bernoulli distribution with parameter θ	

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DEPARTMENT OF STATISTICS

First Internal Assessment -2023-24

Semester:B.Sc.-VI (DSC) P-II	Subject: Sampling Methods, Official Statistics and Econometrics	Code: 036STA013
Date: 12/07/2024	Time: 4.15-5.15pm	Max. Marks: 30

Q. No. 1.	**Answer any Five of the following Questions.**	5×2=10
a)	Define Population and Sample..	
b)	Write two merits of SRS.	
c)	Write down the methods of collecting SRS.	
d)	Define Stratified random sample.	
e)	Write advantages of Stratified random sample	
f)	Define proportional allocation.	
Q. No II	**Answer any Two of the following Questions.**	2×5=10
a)	In SRSWOR show that sample mean is unbiased estimator of population mean.	
b)	Explain method of selecting SRS.	
c)	Explain sampling error and Non sampling error.	
Q. No. III	**Answer any One of the following Question.**	1×10=10
a)	With usual notation prove that $V(y) = (1/n - 1/N)S^2$	
b)	Show that $v(\bar{y}n) \geq v(\bar{y}n)_{prop} \geq v(\bar{y}n)_{Ney}$	

	First/~~Second~~ Internal Assessment -2023-24	
Semester: B.A.- II (OEC)	Subject: Business Statistics.	Code:
Date:11/07/2024	Time: 1.40 pm -2.40 pm	Max. Marks: 30

Q. No. 1.	**Answer any Five of the following Questions.** ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದೇ ಐದು ಪ್ರಶ್ನೆಗೆ ಉತ್ತರಿಸಿರಿ	5×2=10
1	Write the types of measures of central tendency. ಕೇಂದ್ರೀಯ ಪ್ರವೃತ್ತಿಯ ಮಾಪನಗಳನ್ನು ಬರೆಯಿರಿ	
2	Define Mode. ಬಹುಲಕವನ್ನು ವ್ಯಾಖ್ಯಾನಿಸಿರಿ?.	
3	Define kurtosis and write the types of kurtosis. ಶೃಂಗತೆಯನ್ನು ವ್ಯಾಖ್ಯಾನಿಸಿರಿ ಮತ್ತು ಶೃಂಗತೆಯ ವಿಧಗಳನ್ನು ಬರೆಯಿರಿ	
4	Find the geometric mean of 4 and 16 4 ಮತ್ತು 16 ರ ಗುಣೋತ್ತರ ಶ್ರೇಣಿಯನ್ನು ಕಂಡುಹಿಡಿಯಿರಿ.	
5	Define standard deviation and write its formula? ಮಾನಕ ವಿಚಲನೆಯನ್ನು ವ್ಯಾಖ್ಯಾನಿಸಿ ಸೂತ್ರವನ್ನು ಬರೆಯಿರಿ	
6	The given mean=29, mode=26. Find the median value. ಸರಾಸರಿ = 29 ಬಹುಲಕ = 26 ಆದರೆ ಮಧ್ಯಾಂಕವನ್ನು ಕಂಡುಹಿಡಿಯಿರಿ	
Q. No II	**Answer any Two of the following Questions.** ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದೇ ಎರಡು ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿರಿ	2×5=10
7	Write the types of measures dispersion and calculate range for the following data. 80,20,10,50,55,60,22,12 ವಿಚಲನಶೀಲತೆಯ ಮಾಪನಗಳ ವಿಧಗಳನ್ನು ಬರೆಯಿರಿ, ಕೆಳಗಿನ ವ್ಯಾಸಕ್ಕೆ ವ್ಯಾಪ್ತಿಯನ್ನು ಕಂಡುಹಿಡಿಯಿರಿ 80,20,10,50,55,60,22,12	
8	Write the characteristics of Karl Pearson's rank correlation coefficient ಕಾರ್ಲ್ ಪಿಯರ್ ಸನ್ ಸಹಸಂಬಂಧದ ಗುಣಾಂಕದ ಲಕ್ಷಣಗಳನ್ನು ಬರೆಯಿರಿ.	
9	Calculate the rank correlation for the following data.	

X	20	18	21	22	18	16	21	24
Y	30	24	32	34	26	24	30	36

ಕೆಳಗಿನ ನಾಶಕ್ಕೆ ಶ್ರೇಣಿ ಸಹ ಸಂಬಂಧವನ್ನು ಕಂಡುಹಿಡಿಯಿರಿ.

X	20	18	21	22	18	16	21	24
Y	30	24	32	34	26	24	30	36

Q. No. III	**Answer any One of the following Question.** ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದೇ ಒಂದು ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿರಿ	1×10=10

10 Calculate coefficient of variance for the following data.

X	0-10	10-20	20-30	30-40	40-50
Y	3	8	12	10	7

ಕೆಳಗಿನ ನ್ಯಾಸಕ್ಕೆ ವಿಚಲನ ಗುಣಾಂಕವನ್ನು ಕಂಡುಹಿಡಿಯಿರಿ.

X	0-10	10-20	20-30	30-40	40-50
Y	3	8	12	10	7

11 Calculate Mode of the given observations.

X	5-10	10-15	15-20	20-25	25-30
y	6	12	15	8	7

ಕೆಳಗಿನ ವ್ಯಾಸಕ್ಕೆ ಬಹುಲಕವನ್ನು ಕಂಡುಹಿಡಿಯಿರಿ.

X	5-10	10-15	15-20	20-25	25-30
y	6	12	15	8	7

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DEPARTMENT OF STATISTICS
Second Internal Assessment 2023-24

Semester: B.Sc.-II (DSC)	Subject: Probability and Distributions	Code:
Date: 07/08/2024	Time: 9.30 am -10.30 am	Max. Marks: 30

Q. No. I.	**Answer any Five of the following Questions.**
1	Write the recurrence relation of Poissson and Binomial distribution.
2	If 3 coins are tossed write the sample space of it.
3	Who introduced R-programming
4	Mention the 4 basic types of arithmetic mean.
5	Write the MGF of Uniform distribution.
6	What are the different types of number in R.
Q. No II	**Answer any Two of the following Questions.**
7	Write the properties of random variable.
8	Prove that (i) $E(x/n)=P$ (ii) $E(x/n-P)^2=pq/n$ (iii) $E((x-np)/npq)^2=1$
9	Define normal distribution and state its properties.
Q. No. III	**Answer any One of the following Question.**
10	Derive the pmf of Poisson distribution and find its mean and variance.
11	a) Explain about installation of R. b)Explain brief open source philosophy.

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DEPARTMENT OF STATISTICS

Second Internal Assessment -2023-24

Semester:B.Sc.-IV (DSC)	Subject: Statistical Inference-I	Code:
Date: 08/08/2024	Time: 9.00 to 10.00	Max. Marks: 30

Q. No. 1.	**Answer any Five of the following Questions.**	5×2=10
a)	Define Type –I error and Type – II error.	
b)	What is meant by null and alternative hypothesis .	
c)	Define Simple and composite hypothesis..	
d)	Write 95% confidence limits for test for mean?	
e)	Define confidence Estimation and Confidence Interval.	
f)	Write 95% confidence limits test for proportion.	
Q. No II	**Answer any Two of the following Questions.**	2×5=10
a)	Obtain BCR for testing H_0: $\theta = \theta_0$ against H1: $\theta > \theta_0$ based on random sample of size n from a Poisson distribution.	
b)	Obtain the estimate of θ by the method of moment when a random sample of size n is drown from a population with pdf $f(X, \theta) = (1+\theta) X^{\theta}$, $0<X<1$, $\theta > 0$	
c)	Given the probability function $f(x,\theta) = 1/\theta$, $0 \le x \le \theta$ you are testing null hypothesis H0 : $\theta=1$ against H1: $\theta=2$. Obtain the size of Type-I error, Type-II error and power of the test. If you choose interval i. $0.5 \le 1$ ii. $1 \le x \le 1.5$ are the critical regions.	
Q.No. III	**Answer any One of the following Question.**	1×10=10
a)	100(1-α) % confidence Interval for difference between two proportions based on large samples.	
b)	Show that for the distribution $dF(x)= \theta . e^{-x\theta}$ $0<x<\infty$ central confidence limits for large samples with 95% confidence coefficients are given by $\theta = ((1 \pm 1.96)/\sqrt{n})/\bar{x}$	

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DEPARTMENT OF STATISTICS

Second Internal Assessment -2023-24

Semester: B.Sc.-VI (DSC P-I)	Subject: Statistical Inference- II	Code:
Date: 05/08/2024	Time: 03.20 to 04.20	Max. Marks: 30

Q. No. I.	**Answer any Five of the following Questions.**	5×2=10
a)	Define Non-Parametric test..	
b)	Write the test statistics of Mann Whitney-U test.	
c)	State the Kolmogorov-Smirnov test.	
d)	Write the demerits of Non-Parametric test.	
e)	Write the difference between parametric and non-parametric test.	
f)	Define Parametric test and state assumptions of non-parametric test.	
Q. No II	**Answer any Two of the following Questions.**	2×5=10
a)	Write the advantages and disadvantages of non-parametric test.	
b)	Write the Kruskal-Walli's test.	
c)	Write the Median test.	
Q.No. III	**Answer any One of the following Question.**	1×10=10
a)	State and prove Kolmogorov-Smirnov two sample test.	
b)	A company's trainers are randomly divided into 3 groups of 10 each and are given a course in management skill by 3 different methods. At the end of the training period, they are given a test and their scores are as follows. Method A : 99 64 101 85 79 88 97 95 90 100 Method B : 83 102 125 61 91 96 94 89 93 75 Mehtod C : 89 98 56 105 87 90 87 101 76 89 Use Kruskal-Walli(H) test to determine at 5% level of significance if the 3 methods are equally effective.	

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DEPARTMENT OF STATISTICS

Second Internal Assessment -2023-24

Semester: B.Sc.-VI (DSC) P-II	Subject: Sampling Methods, Official Statistics and Econometrics	Code: 036STA013
Date: 08/08/2024	Time: 4.15-5.15pm	Max. Marks: 30

Q. No. 1.	**Answer any Five of the following Questions.**	**5×2=10**
a)	Define CSO	
b)	Write down the methods of collection of official Statistics.	
c)	Define Systematic random sample.	
d)	What is meant by Starta and sampling interval?	
e)	Write advantages of Stratified random sample	
f)	Define Econometrics.	
Q. No II	**Answer any Two of the following Questions.**	**2×5=10**
a)	State the functions of NSS.	
b)	State the functions of CSO.	
c)	What are the statistical assumptions in the least square estimation.	
Q.No. III	**Answer any One of the following Question.**	**1×10=10**
a)	In a Systematic random sampling prove that $V(\bar{y}sys) = (N-1/N)S^2 - (n-1)K/NS^2_{wsy}$	
b)	State and prove any two properties least square estimators in linear regression model	

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DEPARTMENT OF STATISTICS
Second Internal Assessment -2023-24

Semester:B.A.-II (OEC)	Subject: Business Statistics	Code:
Date: 07/08/2024	Time: 3.00 to 4.00	Max. Marks: 30

I	Answer any FIVE of the following Questions. ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದೇ ಐದು ಪ್ರಶ್ನೆಗೆ ಉತ್ತರಿಸಿರಿ	5×2=10
1	Define numerical elements ಅಂಕಿ ಅಂಶಗಳನ್ನು ವ್ಯಾಖ್ಯಾನಿಸಿ.	
2	Write demerits of Median ಮಧ್ಯದ ಡಿಮೆರಿಟ್ಗಳನ್ನು ಬರೆಯಿರಿ.	
3	Write the formula for repeated rank correlation ಪುನರವರ್ತಿತ ಶ್ರೇಣಿಯ ಪರಸ್ಪರ ಸಂಬಂಧಕ್ಕಾಗಿ ಸೂತ್ರವನ್ನು ಬರೆಯಿರಿ.	
4	Write down the two regression equations. ಎರಡು ರಿಗ್ರೇಷನ್ ಸಮೀಕರಣವನ್ನು ಬರೆಯಿರಿ.	
5	What is Index? Write it's limitations. ಸೂಚ್ಯಾಂಕ ಎಂದರೇನು? ಅದರ ಇತಿಮಿತಿಗಳನ್ನು ಬರೆಯಿರಿ.	
6	Write Fisher's ideal price Index. ಫಿಷರ್‌ನ ಆದರ್ಶ ಬೆಲೆ ಸೂಚ್ಯಾಂಕವನ್ನು ಬರೆಯಿರಿ.	
Q. No II	Answer any Two of the following Questions. ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದೇ ಎರಡು ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿರಿ	2×5=10
1	**Calculate the Standard deviation for the following data.** **Marks : 10 20 30 40 50 60** **No. of students : 2 4 6 3 2 1** ಕೆಳಗಿನ ಡೇಟಾಗೆ ಮಾನಕ ವಿಚಲನೆಯನ್ನು ಲೆಕ್ಕಾಚಾರ ಮಾಡಿ. ಅಂಕಗಳು : 10 20 30 40 50 60 ವಿದ್ಯಾರ್ಥಿಗಳ ಸಂಖ್ಯೆ : 2 4 6 3 2 1	
2	**Show that Fisher's Index number satisfies TRT.** ಫಿಷರ್‌ನ ಸೂತ್ರ ಸಮಯ ಪುನರವರ್ತನೆ ಪರೀಕ್ಷೆಯನ್ನು ಅನುಸರಿಸುತ್ತದೆ ಎಂದು ಸಾಧಿಸಿ.	
3	**Fit the regression equation of X on Y** Mean S D X 170 6 Y 75 6 ಕೆಳಗಿನ ನ್ಯಾಸಕ್ಕೆ ಹಿಂಚಲನೆಯ ರೇಖೆಗಳನ್ನು ಕಂಡುಹಿಡಿಯಿರಿ. ಸರಾಸರಿ ಮಾ.ವಿಚಲನೆ X 170 6 Y 75 6	
Q. No. III	Answer any One of the following Question. ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದೇ ಒಂದು ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿರಿ	1×10=10

1	Calculate: I. Laspeyre's II. Paasche's III. Fisher's Price Index number. Commodities Base year Current year A 20 200 35 385 B 15 120 25 200 C 30 90 50 250 D 50 250 75 300 E 75 600 100 700 ಕೆಳಗಿನ ನ್ಯಾಸಕ್ಕೆ ಲಾಸ್ಪೆಯರ್‌ನ, ಫಾಸ್ಚೇಜ್‌ನ ಮತ್ತು ಫಿಷರ್‌ನ ಬೆಲೆ ಸೂಚ್ಯಾಂಕವನ್ನು ಕಂಡುಹಿಡುಯಿರಿ. ಸಾಮಗ್ರಿಗಳು ಆಧಾರ ಅವಧಿ ವರ್ತಮಾನ ಅವಧಿ ಬೆಲೆ ಪ್ರಮಾಣ ಬೆಲೆ ಪ್ರಮಾಣ A 20 200 35 385 B 15 120 25 200 C 30 90 50 250 D 50 250 75 300 E 75 600 100 700
2	Compute Karl Pearson's Coefficient of skewness. Cl 10-20 20-30 30-40 40-50 50-60 60-70 70-80 f 5 8 10 15 6 4 2 ಕಾರ್ಲ್-ಪಿಯರ್ಸನ್ ವಿಷಮತೆಯ ಸೂಚ್ಯಾಂಕವನ್ನು ಕಂಡುಹಿಡಿಯಿರಿ. Cl 10-20 20-30 30-40 40-50 50-60 60-70 70-80 f 5 8 10 15 6 4 2

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DEPARTMENT OF STATISTICS

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2023-24

	B.L.D.E.Association's **S.B. ARTS AND K.C.P. SCIENCE COLLEGE, VIJAYAPUR** **DEPARTMENT OF STATISTICS** **First Internal Assessment 2023-24**	
Semester:BSc-I (DSC)	**Subject: Descriptive Statistics**	**Code:**
Date: 04/01/2024	**Time: 1.30 pm to 2.30 pm**	**Max. Marks: 30**

Q. No. I.	**Answer any Five of the following Questions.**	**5×2=10**
1.	Define Statistics?.	
2.	Mention the types of Measurements of Scale.	
3.	Define Time Series Data.	
4.	Find A.M. of first n-Natural numbers.	
5.	Define GM.	
6.	State any two properties of A.M.	
Q. No II	**Answer any Two of the following Questions.**	**2×5=10**
7.	Write the Scope of Statistics.	
8.	Write the Properties of AM and prove any one.	
9.	Write the types of graphs and explain any one with suitable example	
Q. No. III	**Answer any One of the following Question.**	**1×10=10**
10.	Prove that i) $AM \geq GM \geq HM$ ii) $G^2 = A.H$	
11.	Define Median and Mode. Write the formula for calculation and also write the merits and demerits of median and mode	

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DEPARTMENT OF STATISTICS

First Internal Assessment 2023-24

Semester: B.Sc.-III (DSC)	Subject: Calculus and Probability Distributions	Code:
Date: 3/01/2024	Time: 4.15pm to 5.15pm	Max. Marks: 30

Q. No. 1.	**Answer any Five of the following Questions.**	5×2=10
a)	Write any two application of mean value theorem.	
b)	State the mean value theorem for calculus.	
c)	Define Sequence and Series.	
d)	Define Rectangular distribution.	
e)	Write the mean and variance of Negative Binomial distribution.	
f)	Define Geometric distribution.	
Q. No II	**Answer any Two of the following Questions.**	2×5=10
a)	State and Prove mean value theorem for differentiation.	
b)	Find mean and variance of Rectangular distribution.	
c)	Find mean and variance of Multinomial distribution.	
Q. No. III	**Answer any One of the following Question.**	1×10=10
a)	State and Prove Integration by parts in Riemann-Integrations.	
b)	State and Prove Taylors theorem.	
c)	Find variance of Hypergeometric distribution	

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DEPARTMENT OF STATISTICS
First Internal Assessment 2023-24

Semester: BSc-V (DSC P-I)	**Subject: Matrix Algebra And Regression Analysis**	**Code:**
Date: 03/01/2024	**Time: 3.00 to 4.00 pm**	**Max. Marks: 30**

Q. No. 1.	**Answer any Five of the following Questions.**	**5×2=10**
b)	Define Symmetric and Skew-symmetric matrices.	
b)	Define Idempotent and Orthogonal matrices.	
c)	Define Singular and Non-singular matrices.	
d)	Define Unitary Matrix and give an example.	
e)	Find trace of the matrix A, if $A = \begin{matrix} 4 & 5 & 6 \\ 2 & 3 & 1 \\ 5 & 6 & 7 \end{matrix}$	
f)	Find the determinant of an Identity matrix of order 3.	
Q. No II	**Answer any Two of the following Questions.**	**2×5=10**
a)	Prove that the addition and difference of two symmetric matrices results in symmetric matrix.	
b)	Prove that $tr(A^{l})=tr(A)$ where, A is a square matrix of order 3.	
c)	State any five properties of determinants.	
d)	Find inverse of matrix A, if $A = \begin{matrix} 5 & 6 \\ 2 & 1 \end{matrix}$	
Q. No. III	**Answer any One of the following Question.**	**1×10=10**
a)	If $A = \begin{matrix} 1 & 0 & -1 \\ 3 & 4 & 5 \\ 0 & -6 & -7 \end{matrix}$ then prove that $AA^{-1}= I$	
b)	Evaluate the determinant of the following by using transformations (i) $A = \begin{matrix} 1 & -2 & 7 & 9 \\ 3 & -4 & 5 & 5 \\ 3 & 6 & 1 & -1 \\ 4 & 5 & 3 & 2 \end{matrix}$ (ii) $B = \begin{matrix} 3 & -1 & 0 & 3 \\ 1 & 4 & 1 & 1 \\ 2 & 3 & 1 & 2 \\ 1 & 3 & 2 & -1 \end{matrix}$	

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Semester:BSc-V (DSC P-II)	**Subject: ANOVA AND DESIGN OF EXPERIMENTS**	**Code: 035STA013**
Date: 04/01/2024	**Time: 12.00 pm to 1.00 pm**	**Max. Marks: 30**

Q. No. I.	**Answer any Five of the following Questions.**	**5×2=10**
1.	Define ANOVA.	
2.	State the basic assumption of ANOVA technique.	
3.	Write the ANOVA table for one way classification	
4.	Write the mathematical expression of splitting total sum of squares in two way classification.	
5.	What is meant by Design of Experiments?	
6.	Define the following terms (i) Block (ii) Replication.	
Q. No II	**Answer any Two of the following Questions.**	**2×5=10**
7.	Explain the statistical analysis of one- way classified data.	
8.	Show that MSSE is an unbiased estimator of error variance in one-way classification.	
9.	Define CRD. Explain the layout of a CRD with three treatments A, B, C replicated 6, 5, 4 times respectively.	
Q. No. III	**Answer any One of the following Question.**	**1×10=10**
10.	Obtain the expectation of various sum of squares involved in one way classification.	
11.	Explain the basic principles of Design of experiments.	

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DEPARTMENT OF STATISTICS

First Internal Assessment 2023-24

Semester: BSc-III (OEC)	Subject: : POPULATION STUDIES	Code:
Date: 06/01/2024	Time: 1.30 pm to 2.30 pm	Max. Marks: 30

Q. No. I. Answer any Five of the following Questions. 5×2=10

1. Define population census.
2. What is NSS?
3. What is meant by Coverage and Content error?
4. What are the types of Fertility..
5. Define CBR.
6. The average population of a town in a year was 150000. In year 6000 live births occurred in the town. Find the CBR

Q. No II Answer any Two of the following Questions. 2×5=10

7. Explain the civil registration system with merits and demerits
8. 1. Calculate ASFR for the following data.

Age (in Yrs)	Female Population	Female Births
15-19	16000	480
20-24	14500	812
25-29	13000	650
30-34	11500	460
35-39	10000	300
40-44	8700	87
45-49	7500	30

9. 1. Calculate GFR and ASFR for the following data.

Age (in Yrs)	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Female Population	10000	15000	14000	13000	9000	6000	3000
No. of Live Births	500	900	1400	1170	450	120	30

Q. No. III Answer any One of the following Question. 1×10=10

10. Explain Census survey and sample survey
11. Calculate CBR and TFR for the following data.

Age (in Yrs)	Female Population	No. of Live Births
15-19	58000	1392
20-24	60000	9000
25-29	56000	11928
30-34	55000	6490
35-39	50000	1650
40-44	44000	572
45-49	40000	60

Total Population: 389000

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DEPARTMENT OF STATISTICS
First Internal Assessment 2023-24

Semester: B.A.-I (OEC)	Subject: Statistics in compitative examination.	Code:
Date: 8/01/2024	Time: 8.00-9.00 am	Max. Marks: 30

I	**Answer any FIVE of the following Questions.** ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದೇ ಐದು ಪ್ರಶ್ನೆಗೆ ಉತ್ತರಿಸಿರಿ	5×2=10
1	Define Statistics? ಸಂಖ್ಯಾಶಾಸ್ತ್ರ ಎಂದರೇನು ?	
2	What do you mean by Classifications? ವರ್ಗೀಕರಣ ಎಂದರೇನು ?	
3	Define Arithmetic mean ? ಗಣಿತದ ಸರಾಸರಿ ಎಂದರೇನು ?	
4	Find the median for the following data. 2,6,5,9,8,3,11,8,9,9. ಕೊಟ್ಟಿರುವ ನ್ಯಾಸಗಳಿಗೆ ಮಧ್ಯಂಕ ಕಂಡು ಹಿಡಿಯಿರಿ ? 2,6,5,9,8,3,11,8,9,9.	
5	Define Mode? ಬಹುಲಾಕ್ ಎಂದರೇನು ?	
6	What do you mean by Tabulation? ಕೋಷ್ಟೀಕರಣ ವಿಧಗಳು?	
7	Define Primary Data? ಪ್ರಾಥಮಿಕ ನ್ಯಾಸ ಎಂದರೇನು ?	
Q. No II	**Answer any Two of the following Questions.** ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದೇ ಎರಡು ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿರಿ	2×5=10
1	Write the difference between the diagrams and graphs. ರೇಖಾ ಚಿತ್ರ ಮತ್ತು ನಕ್ಷೆಗಳ ಮದ್ಯ ಇರುವ ವ್ಯತ್ಯಾಸವನ್ನು ಬರೆಯಿರಿ	
2	Draw the Histogram for the following data and hence find mode from it. CI 20-30 30-40 40-50 50-60 60-70 70-80 80-90 f 8 15 20 40 30 18 10 ಕೆಳಗಿನ ನ್ಯಾಸಕ್ಕೆ ಸ್ತಂಭಾನಕ್ಷೆ ರಚಿಸಿ ಮತ್ತು ಅದರಿಂದ ಬಹುಲಕ ಕಂಡು ಹಿಡಿಯಿರಿ ವರ್ಗ 20-30 30-40 40-50 50-60 60-70 70-80 80-90 ಆವೃತ್ತಿ 8 15 20 40 30 18 10	
3	Write the good characteristics of measures of central tendency ಕೇಂದ್ರೀಯ ಪ್ರವೃತ್ತಿಯ ಮಾಪನಗಳ ಗುಣಲಕ್ಷಣಗಳನ್ನು ಬರೆಯಿರಿ	
Q. No. III	**Answer any One of the following Question.** ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದೇ ಒಂದು ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿರಿ	1×10=10
1	Prepare a blank table to show the following characyeristics. Sex: male,female Years: 2000, 2010 Faculty: Arts , Science, Commerece, Engineering and medicine. ಈ ಕೆಳಗಿನ ಗುಣಲಕ್ಷಣಗನ್ನು ತೋರಿಸಲು ಕಾಲಿ ಕೋಷ್ಟಕ ಪಟ್ಟಿ ತಯಾರಿಸಿರಿ 1) ಲಿಂಗ : ಪುರುಷ ಸ್ತ್ರೀ ವರ್ಷಗಳು : ೨೦೦೦ , ೨೦೧೦ ಶಾಖೆ : ಕಲಾ, ವಿಜ್ಞಾನ,ವಾಣಿಜ್ಯ, ತಾಂತ್ರಿಕ ,ಔಷಧ	
2	Calculate median from the following data. CI 10-10 10-20 20-30 30-40 40-50 50-60 60-70 f 5 6 9 13 8 7 4 ಕೆಳಗಿನ ನ್ಯಾಸಗಳಿಂದ ಮಧ್ಯಂಕ ಕಂಡು ಹಿಡಿಯಿರಿ . ವರ್ಗ 0-10 10-20 20-30 30-40 40-50 50-60 60-70 ಆವೃತ್ತಿ 5 6 9 13 8 7 4	

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DEPARTMENT OF STATISTICS
Lab Internal Assessment 2023-24

Semester:BSc-I (DSC) Practical	Subject: Descriptive Statistics	Code:
Date: 03/02/2024	Time: 10.00 pm to 2.00 pm	Max. Marks: 21

Q. No. 1. Answer any Three of the following Questions. 3X7=21

1 Standard tests were administrated to determined IQ scores. These scores are recorded in the following table. 4+3=7

120	115	118	132	135	125	122	140	137	127
129	130	116	119	132	127	133	126	120	125
130	134	135	127	116	115	125	130	142	140

a. Construct a frequency distribution with suitable class intervals.
b. Construct Histogram frequency polygon.

2. Distribution of marks obtained by 110 candidates in Statistics paper of KAS final exam. Compute A.M and G.M 4+3=7

Marks :	10-20	20-30	30-40	40-50	50-60	60-70
No. of Candidates :	5	11	22	35	23	14

3. Compute Coeff of skewwness by Kal-Pearson's method, regarding distribution of Hindu News papers at bus stand by Kiran News agency. 1X7=7

Sales	20-25	25-30	30-35	35-40	40-45	45-50	50-55
Days	8	13	17	14	10	7	3

.

4. Find the median and 7^{th} deciles for the following data. 4+3=7

Wages	0-10	10-20	20-30	30-40	40-50
No. of. workers	22	38	46	35	20

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DEPARTMENT OF STATISTICS

Lab Internal Assessment 2023-24

Semester:BSc-III (DSC) Practical	Subject: Calculus and Probability Distributions	Code:
Date: 03/02/2024	Time: 2.00 pm to 5.00 pm	Max. Marks: 21

Q.No. I. Answer any Three of the following Questions. 3×7=21

1 The joint distribution of x and y is given by the following data 4+3=7

x/y	1	2	3
2	1/8	1/24	1/12
4	1/4	1/4	0
6	1/8	1/24	1/12

I] Find the marginal distribution of x & y

ii] The conditional distribution of y/x=6

2. The joint probability of x & y given by 4+3=7

y/x	1	2	3	4
0	0	0.05	0.05	0.10
1	0.08	0.15	0.10	0.10
2	0.20	0.12	0.05	0

I] compute E (X),E (Y), V(X) & V(Y)

II] Compute E (X+Y),E(XY)

3. Find the least value of $P(1 \leq X \leq 7)$ where x is a random variable with E(X)=4 and V(X)=4

1X7=7

4. If X follows binomial distribution then the mean and variance are 4 and 4/3 respectively. Find $P(X \geq 1)$

1X7=7

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Semester:BSc-V (DSC P-I)	Subject: Matrix Algebra And Regression Analysis(Practical)	Code:
Date: 10/02/2024	Time: 4.00 pm to 5.00 pm	Max.Marks: 21
Q.No. I.	Answer any Three of the following Questions.	3X7=21

1. Find the rank of the matrix A= 1 2 3 4 by direct method.
2 4 6 8
3 6 9 12

2. Find the inverse of the matrix A= 1 2 3 manually and also get result using R-programming.
4 5 6
7 2 9

3. Determine the Eigen values and Eigen vectors manually and also obtain the results using r-programming of the matrix A= -2 2 -3
2 1 -6
-1 -2 0

4. The data in the below table reports the aggregate consumption, Y (billions of U.S. dollars) and disposable income X (billions of U.S. dollars) for a developing economy for the 12 years from 1988 to 1999.

i	1	2	3	4	5	6	7	8	9	10	11	12
Y	102	106	108	110	122	124	128	130	142	148	150	154
X	114	118	126	130	136	140	148	156	160	164	170	178

i. Make a scatter plot of the data.
ii. Stating the assumptions fit a simple linear regression model to the data.

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LAB. Internal Assessment-2023-24

Semester: BSc-V (DSC P-II)	Subject: ANOVA AND DESIGN OF EXPERIMENTS	Code: 035STA013
Date:01/02/2024	Time: 10.00 pm to 11.00 pm	Max. Marks: 20

Q. No. I. **Answer any TWO of the following Questions.** **10×2=20**

1. Three varieties of coal were analyzed by four chemist and ash content in the varieties was found to be are under.

Varieties	Chemists			
	1	2	3	4
A	8	5	5	7
B	7	6	4	4
C	3	6	5	4

Analyse the data and state your conclusion.

2. Three treatments A, B, C are compared in a completely randomized design with four applications each. Analyse the yield and state your conclusion.

A	B	A	C	B	C	C	B	A	C	B	A
81	75	49	28	59	55	48	57	65	48	36	79

3. Following the layout and yield in kgs of 4 varieties of wheat of 4 blocks . Perform an analysis of variance of this data and interpret the results.

I

A	C	D	B
5	13	7	11

II

B	A	D	C
12	6	8	13

III

D	C	A	B
7	15	6	12

IV

C	A	B	D
14	8	18	19

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DEPARTMENT OF STATISTICS

Second Internal Assessment 2023-24

Semester:BSc-I(DSC)	Subject: Descriptive Statistics	Code:
Date: 12/02/2024	Time: 1.30 to 2.30	Max. Marks: 30

Q. No. I.	**Answer any Five of the following Questions.**	5×2=10
1.	Define zero correlation and give an example.	
2.	Show that GM of two regression coefficient is correlation coefficient.	
3.	Name the types of correlation between (i)Income and expenditure of family (ii) Advertisement and sales of goods.	
4.	What is Kurtosis.	
5.	Define standard deviation.	
6.	Write the regression equations of two regression lines.	
Q. No II	**Answer any Two of the following Questions.**	**2×5=10**
7.	What do you mean by skewness explain the various types of skewness of curves with neat diagram.	
8.	State the properties of regression coefficient.	
9.	Show that GM of correlation coefficient equal to regression coefficient	
Q. No. III	**Answer any One of the following Question.**	**1×10=10**
10.	Define Spearman's Rank correlation coefficient and derive the Spearman's formula $R=1-\frac{6\sum d2}{n(n2-1)}$	
11.	Prove that a) For discrete distribution standard deviation is not less than the mean deviation from mean b) Show that standard deviation is independent of change of origin but not scale.	

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Second Internal Assessment -2023-24

Semester:B.Sc.-III (DSC)	Subject: Calculus and Probability Distributions	Code:
Date: 10/02/2024	Time: 4.15-5.15pm	Max. Marks: 30

Q. No. 1.	**Answer any Five of the following Questions.**	5×2=10
a)	Define two dimensional random variables.	
b)	Define independent random variables.	
c)	If $f(x,y)=6x^2y$ and $f(x)=3x^2$ then find the conditional density function of Y given X=x.	
d)	Define Beta distribution of I-kind.	
e)	Write the mean and variance of Uniform distribution.	
f)	Define Cauchy's distribution.	
Q. No II	**Answer any Two of the following Questions.**	2×5=10
a)	State and Prove multiplication property of Expectation.	
b)	State and prove additive property of Gamma distribution.	
c)	Find M.G.F. of Uniform distribution.	
Q. No. III	**Answer any One of the following Question.**	1×10=10
a)	The joint probability density function of a two dimensional random variable (X,Y) if given by $f(x,y)=2$, $0<x<1$, $0<y<x$ (i)Find the marginal density function of X and Y. (ii)Find conditional density function of Y given X=x and of X given Y=y. (iii)Check for independence of X and y.	
b)	Find mean and variance of Beta distribution of II-kind.	
c)	Find mean and variance of Exponential distribution.	

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Second Internal Assessment-2023-24

Semester:BSc-III (OEC)	Subject: : POPULATION STUDIES	Code:
Date: 12/02/2024	Time:8.00 to 9.00	Max. Marks: 30

Q. No. I. Answer any Five of the following Questions. 5×2=10

1. Write the different mortality rates
2. Define MMR
3. Name the types of Migration
4. Calculate CDR if number of deaths 1120 and the total population 98000
5. Write the different columns of life table
6. Define life table.

Q. No II Answer any Two of the following Questions. 2×5=10

7. Write the merits and demerits of CDR and ASDR
8. Find the A.S.D.R for the following data

Age(Years)	Female population	No. of births
0-15	34000	480
15-25	45000	400
25-40	64000	430
40-60	55000	320
60&above	25000	650

9. Explain the components of life table.

Q. No. III Answer any One of the following Question. 1×10=10

10. Calculate the STDR for both the city A and B. Comment on the results.

Age(years)	City A		City B		Standard Population
	Population	Deaths	Population	Deaths	
0-9	9000	20	5500	20	15000
10-19	14000	12	8800	14	35000
30-59	125000	16	7000	20	30000
60+	5500	22	3800	25	20000

11. Explain the migration in detail.

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Second Internal Assessment-2023-24

Semester: BSc-V (DSC P-I)	**Subject: Matrix Algebra And Regression Analysis**	**Code:**
Date: 10/02/2024	**Time: 3.00 to 4.00 pm**	**Max. Marks: 30**

Q. No. 1.	**Answer any Five of the following Questions.**	**5×2=10**
c)	State the Cramer's rule for solving a system of two variables.	
b)	Find the determinant of $A = \begin{matrix} 2 & 5 \\ 6 & 3 \end{matrix}$ and $B = \begin{matrix} 3 & -1 \\ 2 & -1 \end{matrix}$	
c)	Define Rank of a matrix.	
d)	Define Simple Linear Regression.	
e)	Write the Simple linear regression equation and explain its terms.	
f)	Define the terms homoscedasticity and extrapolation.	
Q. No II	**Answer any Two of the following Questions.**	**2×5=10**
a)	Find expectation of Y and variance of Y when the value of X is given in SLR.	
b)	Find rank of the matrix by using canonical form of the matrix $A = \begin{matrix} 1 & -1 & 1 \\ 2 & -3 & 4 \\ 3 & -2 & 3 \end{matrix}$	
c)	Find inverse of the matrix by using elementary row and column operations of $P = \begin{matrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 2 & 9 \end{matrix}$	
Q. No. III	**Answer any One of the following Question.**	**1×10=10**
a)	Explain lack-of-fit test in SLR.	
b)	Find the inverse of the matrix by using partition method $A = \begin{matrix} 1 & 1 & -1 \\ 1 & 2 & 0 \\ 1 & 0 & 5 \end{matrix}$	

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Second Internal Assessment-2023-24

Semester:BSc-V (DSC P-II)	**Subject: ANOVA AND DESIGN OF EXPERIMENTS**	**Code: 035STA013**
Date:12 /02/2024	**Time: 12.00 pm to 1.00 pm**	**Max. Marks: 30**

Q. No. I.	**Answer any Five of the following Questions.**	**5×2=10**
1.	State any two merits of CRD	
2.	Write the mathematical model of RBD	
3.	Write the expression for missing value in LSD.	
4.	Define main effect due to factor A in 2^2 - factorial experiment.	
5.	Define contrast and orthogonal contrast.	
6.	What do you mean by confounding?	
Q. No II	**Answer any Two of the following Questions.**	**2×5=10**
7.	Obtain one missing value in RBD.	
8.	Give the LSD for 4 treatments and write merits and demerits.	
9.	Explain Yate's method of finding factorial effect total in 2^2- factorial experiment	
Q. No. III	**Answer any One of the following Question.**	**1×10=10**
10.	Derive the relative efficiency of RBD over CRD.	
11.	Give the statistical model and ANOVA for a LSD of side k	
12.	Give the statistical analysis of 2^3 - factorial experiment.	

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Second Internal Assessment -2023-24

Semester: B.A.-I (OEC)	Subject: Statistical methods	Code:
Date: 07/02/2024	Time: 10.00-11.00 am	Max. Marks: 30

I **Answer any FIVE of the following Questions.** **5×2=10**
ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದೇ ಐದು ಪ್ರಶ್ನೆಗೆ ಉತ್ತರಿಸಿರಿ

1. Write the properties of t Distribution
ಟಿ ವಿತರಣೆಯ ಗುಣಲಕ್ಷಣಗಳನ್ನು ಬರೆಯಿರಿ

2. Define F distribution
F ಪರೀಕ್ಷೆಯ ವಾಕ್ಯವನ್ನು ಬರೆಯಿರಿ

3. Define Chi square distribution
ಕೈ ವರ್ಗ ಪರೀಕ್ಷೆಯ ವಾಕ್ಯವನ್ನು ಬರೆಯಿರಿ

4. Define null and alternative hypothesis
ಶೂನ್ಯ ಮತ್ತು ಪರ್ಯಾಯ ಪ್ರಾಕಲ್ಪನೆಯನ್ನು ಬರೆಯಿರಿ

5. Define regression
ಹಿಂಜಲನೆಯನ್ನು ವ್ಯಾಖ್ಯಾನಿಸಿ

6. Write the difference between sampling and non sampling error
ನಿದರ್ಶಕಿಯ ಮತ್ತು ನಿದರ್ಶಕಿಯೇತರ ವಿಭ್ರಮೆಗಳ ನಡುವಿನ ವ್ಯತ್ಯಾಸವನ್ನು ಬರೆಯಿರಿ

7. Write the methods of sampling
ನಿದರ್ಶಕಿಯ ವಿಧಾನಗಳನ್ನು ಬರೆಯಿರಿ

Q. No II **Answer any Two of the following Questions.** **2×5=10**
ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದೇ ಎರಡು ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿರಿ

8. Mention the properties of chi-square distribution.
ಕೈ ವಿತರಣೆಯ ಗುಣಲಕ್ಷಣಗಳನ್ನು ಬರೆಯಿರಿ

9. Define Karl-Pearson's correlation coefficients. Write the properties.
ಕಾರ್ಲ್-ಪಿಯರ್ಸನ್ ಅವರ ಸಹಸಂಬಂಧದ ಗುಣಾಂಕದ ವಾಕ್ಯ ಮತ್ತು ಗುಣಲಕ್ಷಣಗಳನ್ನು ಬರೆಯಿರಿ

10. Find the rank correlation between the marks of mathematics and statistics of 8 students.

X	35	47	20	37	63	54	28	40
Y	25	43	27	35	54	61	37	45

ಗಣಿತ ಮತ್ತು ಸಂಖ್ಯಾಶಾಸ್ತ್ರ ವಿಷಯಗಳಲ್ಲಿ 8 ವಿದ್ಯಾರ್ಥಿಗಳ ಅಂಕಗಳು ಕೆಳಗಿನಂತಿವೆ. ಈ ನ್ಯಾಸಕ್ಕೆ ಶ್ರೇಣಿ ಸಹಸಂಬಂಧವನ್ನು ಕಂಡುಹಿಡಿಯಿರಿ.

X	35	47	20	37	63	54	28	40
Y	25	43	27	35	54	61	37	45

Q. No. III **Answer any One of the following Question.** **1×10=10**
ಕೆಳಗಿನವುಗಳಲ್ಲಿ ಯಾವುದೇ ಒಂದು ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿರಿ

1. a) Define binomial distribution. And write the mean and variance of binomial distribution.
   b) Calculate mean and variance for the following probability distribution.

X	0	1	2	3	4
P(X)	3/8	1/4	1/8	3/16	1/16

a) ದ್ವಿಪದೋಕ್ತಿ ವಿತರಣೆಯನ್ನು ವ್ಯಾಖ್ಯಾನಿಸಿ ಮತ್ತು ದ್ವಿಪದೋಕ್ತಿಯ ಸರಾಸರಿ ಮತ್ತು ವಿಚಲನೆಯನ್ನು ಬರೆಯಿರಿ.
b) ಕೆಳಗಿನ ನ್ಯಾಸಕ್ಕೆ ಸರಾಸರಿ ಮತ್ತು ವಿಚಲನೆಯನ್ನು ಕಂಡುಹಿಡಿಯಿರಿ.

X	0	1	2	3	4
P(X)	3/8	1/4	1/8	3/16	1/16

2

a) Explain scatter diagram of measuring correlation.

b) The following data are related to the prize (X) and demand (Y) of a commodity.

X	10	12	13	12	16	15
Y	40	38	43	45	37	43

i) Calculate the two regression lines

ii) Estimate the likely demand when the Price is Rs 18.

a) ಹರಡುವಿಕೆಯ ಚಿತ್ರವನ್ನು ವಿವರಿಸಿರಿ

b)ಕೆಳಗಿನ ಡೇಟಾವು ಸರಕುಗಳ ಬೆಲೆ (X) ಮತ್ತು ಬೇಡಿಕೆ (Y) ಗೆ ಸಂಬಂಧಿಸಿದೆ

X	10	12	13	12	16	15
Y	40	38	43	45	37	43

i) ಎರಡು ಹಿಂಚಲನ ರೇಖೆಗಳನ್ನು ಕಂಡು ಹಿಡಿಯಿರಿ

ii) ಒಂದು ವೇಳೆ X=18 ಇದ್ದಾಗ Y ನ ಬೆಲೆ ಕಂಡು ಹಿಡಿಯಿರಿ