



LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

B.Com. DEGREE EXAMINATION – HONOURS

FOURTH SEMESTER – APRIL 2025

UBH 4504 – BUSINESS STATISTICS



Date: 30-04-2025

Dept. No.

Max. : 100 Marks

Time: 09:00 AM - 12:00 PM

SECTION A - K1 (CO1)

Answer ALL the Questions

(10 x 1 = 10)

1. True or False

- a) Arithmetic mean is always the best measure of central tendency
- b) Range is the best measure of dispersion
- c) Correlation always signifies a cause and effect relationship between the variables.
- d) The regression lines cut each other at the point of average of X and Y.
- e) A basic or non-basic solution is called an optimal solution if it minimizes the total transportation cost.

2. MCQ

- a) The measure of variation that is least affected by extreme observations is:
(i) Range (ii) Mean Deviation (iii) standard deviation (iv) quartile deviation
- b) The value of r^2 = for a particular situation is 0.49. What is the coefficient of correlation?
(i) 0.49 (ii) 0.7 (iii) 0.07 (iv) cannot be determined
- c) The Vogel's Approximation method is also _____
(i) Unit cost penalty method (ii) Spearman (iii) Bowley
- d) The solution to a transportation problem with m- sources and n- destinations is feasible, if the number of allocations are:
(i) $m+n-1$ (ii) $m+n+1$ (iii) $m+n$ (iv) mxn
- e) Which of the following is not associated with an LPP?
(i) Additivity (ii) Divisibility (iii) Proportionality (iv) Uncertainty

SECTION A - K2 (CO1)

Answer ALL the Questions

(10 x 1 = 10)

3. Fill in the blanks

- a) Mean deviation is least when deviations are taken from _____
- b) A time series consists of data arranged _____
- c) If Coeff. of $Sk=0.8$, Median=35, $\sigma=12$, the mean shall be _____
- d) _____ can be unrestricted in the context of an LPP.
- e) The players in a game are called competitors and each player selects a _____ to win the game

4.	Answer the following
a)	What is measures of central tendency?
b)	Define Correlation.
c)	Write a note on quartile deviation
d)	Explain the term feasible solution.
e)	What is game theory?

SECTION B - K3 (CO2)

Answer any TWO of the following in 100 words each.

(2 x 10 = 20)

5. Calculate the mean and standard deviation from the following data:

Value	80-89	70-79	60-69	50-59	40-49	30-39	20-29
Frequency	2	12	22	20	14	4	1

6. Find the regression coefficient of X on Y and Yon X for the following data:

X	3	2	-1	6	4	-2	5
Y	5	13	12	-1	2	20	0

7. An incomplete frequency distribution is given below:

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	Total
Frequency	4	16	-	-	-	6	4	230

Find the missing frequencies of the table given their median is 33.5 and mode is 34. Also calculate the mean using Emperical relationship between mean, median and mode.

8. Fit a trend line equation by the method of least squares and estimate the trend value:

Class	2011	2012	2013	2014	2015	2016	2017	2018
Frequency	80	90	92	83	94	99	92	104

SECTION C – K4 (CO3)

Answer any TWO of the following in 100 words each.

(2 x 10 = 20)

9.	Calculate Pearson's measure of skewness for the following data:								
	Size	7	8	9	10	11	12	13	14
	Frequency	2	11	36	64	39	39	22	2

10.	Find the mean deviation about the mean for the following data:							
	Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70
	Frequency	8	12	10	8	3	2	7

11.	Find the coefficient of correlation between x and y from the following data:						
	X	10	14	15	28	35	48
	Y	74	61	50	54	43	26

12. Solve the transportation problem using VAM

Factory	Distribution Centres				Capacity(units)
	Bangalore	Mumbai	Delhi	Chennai	
Ahmedabad	190	300	500	100	70
Ernakulam	700	300	400	600	90
Hyderabad	400	100	600	200	180
Demand (Units/day)	50	80	70	140	340

SECTION D – K5 (CO4)

Answer any ONE of the following in 250 words

(1 x 20 = 20)

13. A machine producing either product A or B can produce A by using 2 units of chemicals and 1 unit of a compound and can produce B by using 1 unit of chemical and 2 units of compound. Only 800 units of chemicals and 1000 units of compound are available. The profits available per unit of A and B are Rs.30 and Rs.20 respectively. Draw a suitable diagram to show the feasible region. Also, find the optimum allocation of units between A and B to maximize the total profit. Find the maximum profit.

14. A computer while calculating the correlation coefficient between two variables X and Y from 25 pairs of observations obtained the following results:

$$N=25, \sum x = 125, \sum y = 100, \sum x^2 = 650, \sum y^2 = 460, \sum xy = 508$$

It was however, discovered at the time of checking that two pairs of observations were not correctly copied. They were taken as (6,14) and (8,6) while the correct values were (8,12) and (6,8).

Prove that the correct value of the correlation coefficient should be $\frac{2}{3}$.

SECTION E – K6 (CO5)

Answer any ONE of the following in 250 words

(1 x 20 = 20)

15. Find the first four central moments for the following frequency distribution:

Size	0	1	2	3	4	5	6	7	8
Frequency	1	8	28	56	70	56	28	8	1

16. Solve the transportation problem by North- West Corner Rule, Least Cost Method and VAM and test the optimality.

Destinations	Origins			Requirements
	A	B	C	
A	6	4	1	50
B	3	8	7	40
C	4	4	2	60
Availability	20	95	35	150
