LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Com. DEGREE EXAMINATION – **HONOURS**

FOURTH SEMESTER – **APRIL 2023**

UBH 4504 – BUSINESS STATISTICS

Date: 06-05-2023   Dept. No.   Max. : 100 Marks
Time: 09:00 AM - 12:00 NOON

	SECTION A - K1 (CO1)	
	Answer ALL the Questions	**(10 x 1 = 10)**
1.	**Multiple Choice Questions**	
a)	Which of the following is the most unstable average (i) mode (ii) median (iii) GM (iv) HM (v) AM	
b)	The measure of variation that is least affected by extreme observations is: (i) Range (ii) Mean Deviation (iii) Standard Deviation (iv) Quartile deviation (v) all of these.	
c)	Karl Pearson's coefficient of skewness is (i) equal to (ii) less than (iii) greater than (iv) not related to Bowley's coefficient of skewness for skewed distribution.	
d)	Coefficient of determination is defined as (i) r^3 (ii) $1 - r^2$ (iii) $1 + r^3$ (iv) r^2	
e)	The initial solution of a transportation problem is obtained by (i) North West corner rule would invariably be optimum (ii) Least cost method does not provide the least cost solution to a transportation problem. (iii) VAM would invariably be very near to optimum solution. (iv) MODI method is infeasible.	
2.	**True or False**	
a)	The regression lines cut each other at the point of average of X and Y	
b)	The dual to a LPP would have as many variables as the number of constraints in the primal LPP.	
c)	The odd moments in symmetrical distribution are Zero.	
d)	Range is the best measure of dispersion	
e)	A basic or non-basic solution is called an optimal solution if it minimizes the total transportation cost.	
	SECTION A - K2 (CO1)	
	Answer ALL the Questions	**(10 x 1 = 10)**
3.	**Fill in the blanks**	
a)	Median is better suited for …..… interval series.	
b)	In a symmetrical distribution the coefficient of skewness is……..	
c)	Bar diagrams are _____ dimensional diagrams (i) 1 (ii) 2 (iii) 3	
d)	The line obtained by method of least squares is known as the line of …….	
e)	The players in a game are called competitors and each player selects a …….. …. to win the game.	
4.	**Answer the following**	
a)	What do you mean by quartile deviation?	
b)	What is meant by Linear Programming?	
c)	Define Operations Research.	
d)	What is degeneracy in TP?	
e)	Write a note on feasible solution.	

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Answer any TWO of the following in 100 words   **(2 x 10 = 20)**

5. 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.

6. Calculate the mean deviation about the median for the following data:

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	18	16	15	12	10	5	2	2

7. Find the quartile coefficient of skewness of the two groups given below and point out which group more skewed.

Marks	Group A	Group B
55-58	12	20
58-61	17	22
61-64	23	25
64-67	18	13
67-70	11	7

8. Indicate the importance of Time series analysis in Business.

SECTION C – K4 (CO3)

Answer any TWO of the following in 100 words   **(2 x 10 = 20)**

9. Write the steps for Least cost entry method and Vogel's Approximation method.

10. The sales of a commodity (in'000 of Rs.) are given below:

Year	2015	2016	2017	2018	2019	2020	2021
Sales (Rs.'000)	82	86	81	86	92	90	99

(i) Using the method of least squares, fit a straight line trend equation to the data.
(ii) What is the average annual change in the sales?
(iii) Obtain the trend values for the years 2015-2021 and show that the sum of difference between the actual and the trend values is equal to zero.
(iv) What are the expected sales for the year 2026?

11.	Find the regression coefficient of X on Y and Y on X for the following data:							
	X	3	2	-1	6	4	-2	5
	Y	5	13	12	-1	2	20	0

12. Determine the initial basic feasible solution of the following transportation problem using least cost method:

Factory	Distribution Centres				Capacity(units)
	Bangalore	Mumbai	Delhi	Chennai	
Ahmedabad	6	8	8	5	30
Ernakulam	5	11	9	7	40
Hyderabad	8	9	7	13	50
Demand (Units/day)	35	28	32	25	120

SECTION D – K5 (CO4)

Answer any ONE of the following in 250 words   **(1 x 20 = 20)**

13. 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 2/3.

14. Using 4 quartely moving averagesbin respect of the following data , find (i) the trend, (ii) the short term fluctuations) seasonal indices by the ratio to moving average method from the following data:

                    Wheat Prices (in rupees per quintal)

Year	1st Quarter	2nd Quarter	3rd Quarter	4thQuarter
1980	25	15	10	25
1981	8	25	20	30
1982	17	40	25	35
1983	20	45	30	40

SECTION E – K6 (CO5)

Answer any ONE of the following in 250 words   **(1 x 20 = 20)**

15. Solve   the

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

transportation problem by North- West Corner Rule, Least Cost Method and VAM and

test the optimality.

16.

A company has three plants at locations A, B and C which supply to warehouses located at D,E, F, G and H. Monthly plant capacities are 800,500 and 900 units. Monthly warehouses requirements are 400,500,400 and 800 units. Unit transportation costs (in Rs.) are given below:

From	To				
	D	E	F	G	H
A	5	8	6	6	3
B	4	7	7	6	6
C	8	4	6	6	3

Determine an optimum distribution for the company inorder to minimize the total transportation cost.

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