

# KAMARAJ COLLEGE (Autonomous)

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(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(5 Pages)

Reg. No:.....

Question Code: 26E00204

Course Code : 24UEMA31

UG Degree - End Semester Examinations, April 2026

Third Semester  
B.Sc., MATHEMATICS

Statistics-I

(For those who joined in July 2024 onwards)

Time : 3Hours

Maximum : 75 Marks

## PART - A (10 × 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer :

- CO:1 1. In mesokurtic, the value of  $\beta_2$  and  $\gamma_2$  are \_\_\_\_\_.  
K:1 (a) 3,0 (b) 0,3  
(c) 1,2 (d) 2,1
- CO:1 2. For the random variable X,  $\mu_1 = 0$  and  $\mu_2 = 74$ , the mean of the  
K:2 random variable is \_\_\_\_\_.  
(a) 8 (b) 68  
(c) 64 (d) 32
- CO:2 3. The variable X and Y are uncorrelated then  $Cov(X,Y)$   
K:1 = \_\_\_\_\_.  
(a) 1 (b) 0  
(c) -1 (d) 2
- CO:2 4. For rank correlation coefficient  $\rho$  the correct statement is  
K:2 \_\_\_\_\_.  
(a)  $-1 < \rho < 1$  (b)  $-1 \leq \rho \leq 1$   
(c)  $0 < \rho < 1$  (d)  $-\infty < \rho < \infty$
- CO:3 5. The regression coefficient of two variables \_\_\_\_\_.  
K:1 (a) Is never greater than 1 (b) Is always less than 1  
(c) Is always 0 (d) Lies between  $-\infty$  to  $\infty$

- C0:3 6. If  $\gamma = 0$  then two regression lines are \_\_\_\_\_.
- K:2 (a) Parallel (b) Perpendicular  
(c) Neither Parallel nor Perpendicular (d) Coincident
- C0:4 7. A survey reveals that out of 1000 people in a locality 800 like  
K:1 coffee, 700 like tea, 660 like both. The number of people liking neither coffee nor tea is \_\_\_\_\_.
- (a) 40 (b) 100  
(c) 160 (d) 200
- C0:4 8. For any four given attributes total number of positive class  
K:2 frequencies is \_\_\_\_\_.
- (a) 15 (b) 81  
(c) 17 (d) 16
- C0:5 9. With standard notation Paasche's index number is \_\_\_\_\_.
- K:1 (a)  $\frac{\sum p_1 q_0}{\sum p_0 q_1} \times 100$  (b)  $\frac{\sum p_1 q_0}{\sum p_1 q_1} \times 100$   
(c)  $\frac{\sum p_1 q_1}{\sum p_0 q_1} \times 100$  (d)  $\frac{\sum p_1 q_1}{\sum p_0 q_0} \times 100$
- C0:5 10. If the Laspeyre's and Paasche's index numbers are respectively  $m$   
K:1 and  $n$  then the Fisher's index number is \_\_\_\_\_.
- (a)  $\frac{m+n}{2}$  (b)  $\sqrt{mn}$   
(c)  $\frac{2mn}{m+n}$  (d)  $mn$

**PART - B (5 X 5 = 25 Marks)**

**Answer ALL Questions choosing either (a) or (b).**

**Answer should not exceed 250 words.**

- C0:1 11. (a) In a group of 200 candidates, the mean and standard  
K:3 deviation of scores were found to be 40 and 15 respectively. Later on it was discovered that the scores 43 and 35 were misread as 34 and 53 respectively. Find the corrected mean and standard deviation corresponding to the correct figures.

**(OR)**

- (b) Illustrate that, for a discrete distribution,  $\beta_2 > 1$ .

CO:2 12. (a) Prove that the correlation coefficient is independent of  
K:4 change of origin and scale.

**(OR)**

(b) Show that if  $X', Y'$  are the deviations of the random variables  $X$  and  $Y$  from their respective means, then

$$\gamma = 1 - \frac{1}{2N} \sum_i \left( \frac{X_i'}{\sigma_X} - \frac{Y_i'}{\sigma_Y} \right)^2$$

CO:3 13. (a) Demonstrate that if one of the regression coefficients is  
K:4 greater than unity, then the other must be less than unity.

**(OR)**

(b) Find the most likely price in Mumbai corresponding to the price of Rs. 70 at Kolkata from the following

	Kolkata	Mumbai
Average Price	65	67
S.D	2.5	3.5

Correlation coefficient between the prices of commodities in the two cities is 0.8.

CO:4 14. (a) From the following set of positive frequencies, obtain all  
K:3 other class frequencies  $N = 500$ ,  $(AB) = 140$ ,  
 $(A) = 160$ ,  $(B) = 200$ .

**(OR)**

(b) In an analysis of two attributes if  $N=1000$ ,  $(A)=100$  and  $(B)=300$ , find the frequencies of the remaining classes on the assumption that  $A$  and  $B$  are independent.

CO:5 15. (a) From the fixed base index numbers given below, prepare a  
K:3 chain base index number

years	1975	1976	1977	1978	1979	1980
fixed base index numbers	90	105	102	98	120	125

**(OR)**

- (b) From the chain base index numbers given below prepare a fixed base index number

years	1985	1986	1987	1988	1989	1990	1991
chain base index numbers	105	108	110	107	115	120	125

**PART - C (5 X 8 = 40 Marks)**

**Answer ALL Questions choosing either (a) or (b).**

**Answer should not exceed 500 words.**

- CO:1 16. (a) Calculate (i) Quartile deviation (ii) Mean deviation from mean for the following data  
K:4

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. Of Students	6	5	8	15	7	6	3

**(OR)**

- (b) For a distribution the mean is 10, variance is 16,  $\gamma_1$  is 1 and  $\beta_2$  is 4. Obtain the first four moments about the origin. Comment upon the nature of distribution.

- CO:2 17. (a) Compute the coefficient of correlation between  $X$  and  $Y$  from the following data  
K:5

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

**(OR)**

- (b) Find the rank correlation coefficient for the following data

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

- CO:3 18. (a) Obtain the equation of two lines of regression for the following data. Also obtain the estimate value of  $X$  for  $Y=70$ .  
K:5

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

(OR)

- (b) Fit an exponential curve of the form  $Y = ab^X$  to the following data

X	1	2	3	4	5	6	7	8
Y	1.0	1.2	1.8	2.5	3.6	4.7	6.6	9.1

- CO:4 19. (a) An investigation of 23,713 households was made in an urban and rural mixed locality. Of these 1,618 were farmers, 2,015 well-to-do and 770 families were having at least one graduate. Of these graduate families 335 were those of farmers and 428 were well-to-do, also 587 well-to-do families were those of farmers and out of them only 156 were having at least one of their family members as graduate. Obtain all the ultimate class frequencies.

K:4

(OR)

- (b) 800 candidates of both sexes appeared at an examination. The boys outnumbered the girls by 15% of the total. The number of candidates who passed exceeds the number failed by 480. Equal number of boys and girls failed in the examination. Prepare a 2 X 2 table and find the coefficient of association.

- CO:5 20. (a) Find the missing price of the following data if the ratio between Laspeyre's and Paasche's index numbers is 25:24.

K:6

Commodities	Base year		Current year	
	Price	quantity	Price	quantity
A	1	15	2	15
B	2	15	---	30

(OR)

- (b) From the following data of the whole sale price of rice for the 5 years construct the index number taking 1987 as the base

years	1987	1988	1989	1990	1991	1992
Price of rice per Kg	5	6	6.5	7	7.5	8