

Seat No. : _____

AL-106

April-2025

Int. MBA., Sem.-IV

Business Statistics

Time : 2:00 Hours]

[Max. Marks : 50

- Instructions :** (1) Non-Programmable Scientific Calculator can be used.
(2) Statistical Tables will be provided on request.
(3) Attempt new questions on new page.

1. Attempt the following : (Any two) 10
- (a) Give probability density function for Poisson distribution. Also give its properties and uses.
- (b) A set of 10 tubes is received which is known to contain 3 defectives. If a sample of 3 tubes is taken randomly, what is the probability that it will consist of :
- (i) Two good tubes
(ii) All three good tubes ?
- (c) The average income of the residents of a state is ₹ 18,500 and the standard deviation is ₹ 1,000. If it is decided to exempt people from the lowest 30 percent bracket and impose income tax on others, what should be the minimum taxable income ? Assume incomes to be normally distributed.

2. Attempt the following : (Any Two) 10
- (a) A sample of eight employees was taken from the production department of a light engineering factory. The data given below relates to the number of weeks' experience in the wiring of components and the number of components which were rejected as unsatisfactory last week :

Employee	A	B	C	D	E	F	G	H
Weeks of Experience	4	5	7	9	10	11	12	14
Number of Rejects	21	22	15	18	14	14	11	13

Obtain the coefficient of correlation between number of rejects and experience.

- (b) The coefficient of rank correlation of the marks obtained by 10 students in Statistics and Accountancy was found to be 0.2. It was discovered later that the differences in ranks of two subjects obtained by a student were wrongly taken as 9 instead of 7. Find the corrected value of the rank correlation.
- (c) From a survey of 530 persons regarding their proficiency in speaking English and Hindi, it was observed that 245 persons could speak Hindi fluently and of them 98 could not speak English fluently. The number of persons speaking fluent English, but not fluent Hindi was 190. From this information find out the coefficient of association proficiency between English and Hindi.

3. Attempt the following :

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- (a) What do you mean by regression ? Give equations for two lines of regression and mention the properties of regression coefficient.
- (b) For the following problem relating to advertising expenditure and sales of 40 comparable firms, obtain the regression equation to predict the value of sales if advertising expenditure is 23.

Sales Revenue (‘000 ₹)	Advertisement Expenditure (‘000 ₹)				Total
	5 – 15	15 – 25	25 – 35	35 – 45	
75 – 125	4	1	–	–	5
125 – 175	7	6	2	1	16
175 – 225	1	3	4	2	10
225 – 275	1	1	3	4	9
Total	13	11	9	7	40

4. Attempt the following : (Any two)

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- (a) In a three – variate multiple correlation find $R_{1.23}$ where $r_{12} = 0.5$, $r_{13} = 0.7$, $r_{23} = 0.6$.
- (b) If $\sigma_1 = 2$, $\sigma_2 = 3$, $\sigma_3 = 3$, $r_{12} = 0.6$, $r_{23} = r_{13} = 0.5$ find $r_{12.3}$ and $b_{12.3}$.
- (c) Given $r_{12} = 0.28$, $r_{23} = 0.49$, $r_{31} = 0.51$, $\sigma_1 = 2.7$, $\sigma_2 = 2.4$, $\sigma_3 = 2.7$. Find the regression equation of x_3 on x_1 and x_2 .

5. Attempt following :

10

(Attempt the question in given order and mentioned correct option for the answer with the question number, for example like :

(1) – a,

(2) – b, ... and so on.)

(1) For Binomial distribution mean is _____ variance.

(a) greater than

(b) less than

(c) equals to

(d) None

(2) For Poisson distribution mean is _____ variance.

(a) greater than

(b) less than

(c) equals to

(d) None

(3) For exponential distribution mean is _____ standard deviation.

(a) greater than

(b) less than

(c) equals to

(d) None

(4) Correlation co-efficient lies between

(a) $-\infty$ to $+\infty$

(b) -1 to $+1$

(c) -1 to 0

(d) 0 to $+1$

(5) Product of two regression co-efficient is

(a) Correlation coefficient

(b) Covariance

(c) Coefficient of determination

(d) None

- (6) For Linear correlation _____ variables required.
- (a) one
 - (b) two
 - (c) three
 - (d) four
- (7) For multiple regression minimum _____ variables required.
- (a) one
 - (b) two
 - (c) three
 - (d) four
- (8) Yule's co-efficient of Association lies between
- (a) $-\infty$ to $+\infty$
 - (b) -1 to $+1$
 - (c) -1 to 0
 - (d) 0 to $+1$
- (9) Uniform distribution is also known as _____ distribution.
- (a) Square
 - (b) Rectangle
 - (c) Oval
 - (d) Round
- (10) In exponential distribution range of the variable x is
- (a) $X > 0$
 - (b) $X \geq 0$
 - (c) $X < 0$
 - (d) $X \leq 0$
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