PG/IIS/MLI/208/25

MLIBISc. 2nd Semester Examination, 2025

MASTER OF LIBRARY AND INFORMATION SCIENCE

(*Quantitative Techniques in Research*)

PAPER – MLI-208

Full Marks : 50

Time : 2 hours

Answer all questions

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

GROUP—A

Answer any two questions : 10×2

1. Derive the relationship between the correlation Coefficient and Regression Coefficient of two random variables x and y. Define class limit, range and class boundary. 5 + 5

2. Discuss different types of data used in social science discipline. Define moment, skewness and kurtosis of a random variable x. 6 + 4

3. Prove that the Correlarion Coefficient between two random variables 'x' and 'y' is not affected by the changes of the both scale and origin. Define Chi-square distribution and conditional probability. 5 + 3 + 2

4. The data given records the number of articles published and the number of citations received by twelve authors : 10

The Days	No. of articles published (x)	No. of citation received (y)
Day 1	8	30
Day 2	10	26
Day 3	12	28
Day 4	13	25
Day 5	12	33
Day 6	15	40
Day 7	19	37
Day 8	17	41
Day 9	22	42
Day 10	25	36
Day 11	28	43
Day 12	32	56

Find out the number of citations received by an author who published 35 articles.

GROUP–B

Answer any **four** questions : 5×4

5. Prove that the geometric mean of the random variable (x_i) for 'n' number of observations corresponding to $i = 1, 2, 3, \ldots\ldots n$, is equal to the geometric mean of the arithmetic mean and harmonic mean of the same variable (x_i) for the same set of 'n' observations. Define Coefficient of Variation. $4 + 1$

6. For any two discrete random variables x_1 and x_2, show that AM $\geq$ GM $\geq$ HM. What is Frequency Dessity ? $4 + 1$

7. Prove that the standard deviation is independent of any change of origin, but depends on the change of scale. What is an exponential function ? $3\frac{1}{2} + 1\frac{1}{2}$

(*Continued*)

8. Show that the variance of the discrete random variable 'x_i' is equal to the difference between the average of the square and the square of the average of x_i, for $i = 1, 2, 3, ... n$. Define Median and Mode for ungrouped sets of data. 3 + 2

9. State different merits and demerits of Arithmatic Mean and Geometric Mean. $2\frac{1}{2}+2\frac{1}{2}$

10. For a library, the data for the number of footfalls and the number of books issued for seven days is presented as follows :

S. No.	No. of footfalls (x)	No. of books issued (y)
Day 1	10	12
Day 2	12	11
Day 3	15	13
Day 4	13	14
Day 5	17	18
Day 6	26	10
Day 7	21	17

Find out whether the number of books issued is at all affected by the number of footfalls and interpret your result. 5

[Internal Assessment — 10 Marks]