2019

M.LIB.I.Sc.

2nd Semester Examination

QUANTITATIVE TECHNIQUES IN LIBRARY AND INFORMATION CENTRES

Paper - MLI 210

Full Marks : 40   Time : 2 Hours

The figures in the margin indicate full marks.

1. Answer any **four** questions :   2×4

   (a) Define weighted harmonic mean for $x_1(f_1)$ and $x_2(f_2)$, where x_1 and x_2 are two discrete random variables with corresponding frequencies f_1 and f_2.

   (b) Define class interval and class frequency.

   (c) Distinguish between discrete variable and continuous variable.

[Turn Over]

(d) Define median for the discrete random variable x, where $x \rightarrow (x_1, x_2, x_3 ... x_n)$.

(e) If $\log(64) = 2.64$, then find the value of $\log(16)$.

(f) Define simple arithmetic mean and simple geometric mean for two discrete random variables x_1 and x_2.

(g) Define variance of the discrete random variable x (Var(x)), where $x \rightarrow (x_1, x_2, x_3 ... x_n)$.

(h) Consider the following set of data :

x	f
2	3
2	1
2	2

Find out the weighted geometric mean

2. Answer any **four** questions :   4×4

(a) Show that AM>GM>HM, for x_1 and x_2 where x1 and x2 are two discrete random variables, where AM = Arithmetic Mean, GM = Geometric Mean and HM = Harmonic Mean.

(b) Show that the logarithm of Geometric Mean (GM) of a set of variables is equal to the Arithmetic Mean (AM) of their logarithms.

(c) Define mean deviation and standard deviation of x, where x is a discrete random variable and $x \rightarrow \left(x_1, x_2, x_3 ... x_n\right)$.

(d) Show that variance of the discrete random variable x, Var(x) = (square of the average values of x - Average of the squares of x), $x \rightarrow \left(x_1, x_2, x_3 ... x_n\right)$.

(e) Define Pearson's product-moment correlation coefficient and Spearman's rank correlation coefficient.

(f) Define one bit of information from the viewpoint of probability.

(g) Define Pearsonian Chi Square. State the uses of Chi Square distribution.

(h) Define class limit and class boundary.

[Turn Over]

3. Answer any **two** of the following questions : 8×2

(a) Show that $b_{yx} \cdot b_{xy} = \left(r_{xy} \right)^2$ where $b_{yx} =$ Regression Cofficient of y on x and $b_{yx} =$ Regression Coefficient of x on y.

(b) Show that R (Rank correlation coefficient) = $1 - 6 * \sum d_i^2 / \left(n^3 - n \right)$, where i = 1, 2...n and di = $x_i - y_i$, x and y indicate two different ranking from 1 to n.

(c) Data given below show the age and h-index of six authors. Determine, with proper interpretation, whether any correlation exists between age and h-index.

Age	h-index
31	7
36	8
43	14
50	11
55	10
60	12

(d) Data given below show the number of vistiors and number of books issued for six days in a libary. Find out the number of visitors in a day when 20 books were issued.

No. of visitors	No. of books issued
20	17
22	18
25	22
23	23
26	24
28	25

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