'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL
B.A./B.Sc. Honours 3rd Semester Examination, 2021

CC7-ECONOMICS (307)

Time Allotted: 2 Hours   Full Marks: 60

The figures in the margin indicate full marks.

GROUP-A
Answer any *four* questions from the following   3×4 = 12

1. (a) Distinguish between class limit and class boundary with suitable example.   3

   (b) Prove that the standard deviation of first n natural numbers is $\frac{n^2-1}{12}$.   3

   (c) Prove that the standard deviation calculated from the two values x_1 and x_2 of a variable x is equal to half of their difference.   3

   (d) For a symmetrical distribution $Q_1 = 24$ and $Q_3 = 42$. Find median.   3

   (e) Show that mean deviation about mean cannot exceed the standard deviation. When are they equal?   2+1

   (f) What do you mean by skewness of a distribution?   3

GROUP-B
Answer any *four* questions from the following   6×4 = 24

2.   Show that $\sum_{i=1}^{n}(x_i - A)^2$ is least when A = arithmetic mean.   6

3.   Prove that coefficient of correlation lies between − 1 and + 1.   6

4.   If x and y are uncorrelated variables and their standard deviations are 3 and 4 respectively, find the correlation coefficient between $5x + 2y$ and $2x - 5y$.   6

5.   What are regression coefficients in bivariate data? Prove that the regression coefficients do not depend on change of origin but depend on change of scale.   2+4

6. Calculate the standard deviation from the following distribution: 6

x :   1   2   3   4   5   6   7

Frequency :   10   20   30   35   14   10   2

7. Discuss the concept of Lorenz curve as representation of distribution of income. 6

GROUP-C

Answer any *two* questions from the following $12 \times 2 = 24$

8. (a) Prove that standard deviation is independent of any change of origin but is dependent on the change of scale.   4+8

    (b) Calculate standard deviation from the following frequency distribution:

Weight (lb.) :	131-140	141-150	151-160	161-170	171-180	181-190
Number of Persons :	2	5	4	9	7	5

9. For any given set of observations prove that $A.M. \geq G.M. \geq H.M.$ Under what conditions are they equal?   10+2

10. Find mean deviation about mean and median from the following frequency distribution: 6+6

Daily wage (Rs.) :	8-11	12-15	16-19	20-23	24-27
Number of Workers :	5	11	20	10	4

11. Derive the regression equation of *y* on *x* and *x* on *y*.   12

12. (a) What do you mean by rank correlation?   2+10

    (b) Compute Karl Pearson's coefficient of correlation in the following series relating to price and supply of a commodity.

Price (Rs.) :	11	12	13	14	15	16	17	18	19	20
Supply (Kg.) :	30	29	29	25	24	24	24	21	18	15

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