



**UNIVERSITY OF NORTH BENGAL**  
B.A./B.Sc. Honours 3rd Semester Examination, 2020

**CC7-ECONOMICS (307)**  
**STATISTICAL METHODS FOR ECONOMICS-I**

Full Marks: 60

**ASSIGNMENT**

*The figures in the margin indicate full marks.*

**GROUP-A**

**Answer any two questions from the following** 20×2 = 40

1. (a) Show that for a given set of observations the sum of the squares of derivations is the minimum when the deviations are taken from the Arithmetic mean. 8+8+4 = 20
- (b) Find Median for the following frequency distribution:  

Class interval:	130-134	135-139	140-144	145-149	150-154	155-159	160-164
Frequency:	5	15	28	24	17	10	1
- (c) The mean age of a combined group of boys and girls is 15 years. If the mean age of the group of boys is 13 years and that of the group of girls is 18, find the percentage of girls and boys in the group.
2. (a) 'Standard deviation is regarded as superior to other measures of dispersion'. Justify the statement. 8+8+4 = 20
- (b) For a distribution of 280 observations, Mean and Standard deviation were found to be 54 and 3 respectively. On checking it was observed that two observations, which should correctly read as 62 and 82, had been wrongly recorded as 64 and 80 respectively. Calculate the correct values of Mean and Standard deviation.
- (c) The Mean and Standard deviation of a variable  $x$  are known to be 38 and 6 respectively. Find the Mean and Standard deviation of  $(100 - 2x)$ .
3. (a) Prove that the Correlation coefficient ( $r$ ) lies between  $-1$  and  $+1$ . 6+4+10=20
- (b) If  $u + 3x = 5$ ,  $2y - v = 7$  and the Correlation coefficient of  $x$  and  $y$  are 0.12, find the Correlation coefficient of  $u$  and  $v$ .
- (c) Find the angle between the two Regression lines. What is the value of Correlation coefficient if (i) the lines are perpendicular to each other (ii) the lines coincide.

4. (a) What is Least Square method? Explain the method for fitting a straight line  $y = mx + c$  to a given set of  $n$  pairs of observations  $(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)$ . 10+10 = 20
- (b) Fit a straight line to the following data and estimate the most probable yield of rice for 40 inches of water level.
- |                           |      |      |      |      |      |      |      |
|---------------------------|------|------|------|------|------|------|------|
| Water level $x$ (inches): | 12   | 18   | 24   | 30   | 36   | 42   | 48   |
| Yields $Y$ (tons):        | 5.27 | 5.68 | 6.25 | 7.21 | 8.02 | 8.71 | 8.42 |

**GROUP-B**

**Answer any two questions from the following**

10×2 = 20

5. (a) Find the Arithmetic mean of two observations if their Geometric mean and Harmonic mean are 15 and 9 respectively. 3+7 = 10
- (b) Find the Mean and Standard deviation of first  $n$  natural numbers.

6. Find the Mean deviation about Mean of the following data: 10

Height (inches):	60-62	63-65	66-68	69-71	72-74
Frequency:	5	18	42	27	8

7. Marks obtained in Mathematics and English by 10 students of a class are as follows: 8+2 = 10

Student:	A	B	C	D	E	F	G	H	I	J
Maths:	61	38	49	57	42	34	93	87	46	35
English:	32	38	28	35	19	42	45	48	22	25

Calculate Spearman's Rank correlation and interpret the result.

8. The Regression equations of  $x$  on  $y$  and  $y$  on  $x$  are: 4+3+3 = 10  
 $40x - 18y - 214 = 0$  and  $8x - 10y + 66 = 0$  respectively.

Find the values of

- (i) Arithmetic mean of  $x$  and  $y$
- (ii) Correlation coefficient between  $x$  and  $y$
- (iii) Standard deviation of  $y$  if the Standard deviation of  $x$  is 3.

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