

BACHELOR OF ARTS EXAMINATION, 2019
(1ST YEAR, 2ND SEMESTER)

ECONOMICS (HONOURS)

Paper: Statistical Methods in Economics

Answer Question 1 and any one question from the rest

Two Hours

Full Marks: 30

1. Answer briefly six questions from the following:
 - (a) Find the harmonic mean of 9 observations of the form $(1/x)$, where $x = 1$ to 9.
 - (b) Show $\Sigma(x_i + 1)^2 f_i = \Sigma x_i^2 f_i + 2\Sigma x_i f_i + N$, where $N = \Sigma n_i$
 - (c) Can the distance between Q_3 and Median and Median and Q_1 give a statistic for the distribution of the values of a variable? Justify.
 - (d) Show that the r^2 is the ratio of the variance of the computed Y_i to the variance of the observed y_i .
 - (e) Can the Laspeyres' and Paasche's formula lead to same price index? Justify.
 - (f) Prove that the variance of the first N positive integers is $(N^2 - 1)/12$.
 - (g) Can a statistician carry out Sheppard's Correction for all order of moments when there is inaccuracy in the original data or errors due to sampling fluctuations? Justify.
 - (h) What is the weight for each commodity in geometric mean quantity index?
 - (i) In case of k -statistic, what is k_4 when the sample size is large? 2.5x6

2. a) Fit a straight line trend to the given data on sales of potato (in quintals) in West Bengal using the method of least squares and comment on the estimated coefficients.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Sales (qtl.)	97	113	129	202	195	193	201	237	235	248

- b) Calculate Q_1 , Q_2 and Q_3 of heights of students in a class from the following Table 1. Locate the median using the cumulative frequency curves in the graph paper provided and what can you comment on the distribution of height in the class.

[Turn over

Table 1: Height of students in a class

Height (in inches)	Frequency
60-62	5
63-65	16
66-68	37
69-71	25
72-74	12
75-77	4
78-80	1

(3.5+2)+(4.5+3+2)

3. a) Show $Ns^2 = n_1s_1^2 + n_2s_2^2 + (n_1n_2/N).(x_1 - x_2)^2$, where $N = n_1 + n_2$, and s_i and x_i are respectively the standard deviation and mean for the i^{th} group.

b) What is the relationship between the r^{th} order standardized moments about the origin and non-standardized moments about the origin for the population. When is such standardized moment unity?

c) The following data represent the ages of husband (x) and wife (y) for twenty couples.

x	22	24	26	26	27	27	28	28	29	30
y	18	20	20	24	22	24	27	24	21	25

x	30	30	31	32	33	34	35	35	36	37
y	29	32	27	27	30	27	30	31	30	32

Find the regression lines 'y on x' and 'x on y'. Calculate r^2 based on the slope coefficients of both the regression lines. What is the interpretation of the correlation coefficient based on the regression lines? 3+3+(5+2+2)