

# The Assam Royal Global University, Guwahati

Royal School of Humanities and Social Sciences

BA Economics 4<sup>th</sup> Semester

Semester End Examination, August 2021

Course Title: Elementary Econometrics

Course Code: ECO182C402

Time: 3 Hours

Maximum Marks: 70

**Note: Attempt all questions as per instructions given.**

*The figures in the right-hand margin indicate marks.*

## Section – A

1. Attempt **all** questions. (Maximum word limit 50)

2x 8=16

- Define cross section data and time series data.
- Write the steps of econometric analysis.
- Define correlation.
- Give the definition of null hypothesis and alternative hypothesis.
- Write the significance of the 'disturbance term' in regression equation.
- Define sample regression function (SRF).
- What is autocorrelation?
- Define heteroskedasticity.

2. Attempt **any two** of the following:

6 x 2=12

- 'Ordinary least square estimates are always BLUE'. Write the properties of BLUE.
- What is meant by specification of econometric equation? Explain with an example.
- Prove that total sum of square is equal to sum of residual sum of squares and explained sum of squares.  $SST=SSE+SSR$

3. Attempt **any two** of the following:

7 x 2=14

a. Given below are the marks obtained by 10 students in Economics and Statistics

|               |    |    |    |    |    |    |    |    |    |    |
|---------------|----|----|----|----|----|----|----|----|----|----|
| Economics(X)  | 32 | 38 | 48 | 43 | 40 | 22 | 41 | 69 | 35 | 64 |
| Statistics(Y) | 30 | 31 | 38 | 43 | 33 | 11 | 27 | 76 | 40 | 59 |

Determine the Karl Pearson correlation co-efficient between X and Y.

b. Obtain the lines of regression for the following data:

|   |     |    |    |     |
|---|-----|----|----|-----|
| x | 120 | 90 | 80 | 150 |
| y | 40  | 36 | 40 | 44  |

c. A random sample of size 16 has 53 as mean. The sum of squares of deviation from mean is 150. Can this sample be regarded as taken from the population having 56 as mean? Given  $|t_{0.05}(15)| = 2.131$ .

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**Section – B**

**4. Attempt any two of the following:**

**7 x 2=14**

a. Following equation is estimated by OLS:

$$\widehat{colgpa} = 1.392 - .0135 hsperc + .00148sat$$
$$n = 4,137, R^2 = .273$$

*colgpa* = GPA of college student, *hsperc* = is the percentile in in the high school graduating class and *sat* = is the combined math and verbal scores on the student achievement test.

- i. What is the predicted college GPA when *hsperc* = 20 and *sat* = 1,050? 2
- ii. Interpret the effect of *hsperc*, *sat* on *colgpa*. 2
- iii. Discuss the sign of *hsperc*, *sat*. 2
- iv. Interpret  $R^2$ . 1

b. Write the assumptions of Ordinary least square (OLS) estimate.

c. What is F test? Explain the significance of F test in econometric analysis.

**5. Attempt any two of the following:**

**7 x 2=14**

- a. "OLS estimate is no longer efficient in the presence of heteroskedasticity" - explain.
- b. Explain the problem of Multicollinearity in econometric analysis.
- c. What are the causes and consequences of autocorrelation? Explain