



University of Sri Jayewardenepura
Faculty of Humanities and Social Sciences

Bachelor of Arts Second Year Second Semester Examination – January/February 2019

Economics

ECON 2250.03 – Statistics for Economics

Duration: Three hours (03)

Answer only **five (05)** questions.

Calculators are allowed to use. Statistical tables will be provided.

01. i. Describe the difference between descriptive statistics and inferential Statistics with suitable examples. (4 marks)
- ii. "Use of secondary data for an economic research is more productive than using primary data" Do you agree with this statement? Explain your answer. (6 marks)
- i. Explain what is probability sampling and the different methods of it. (6 marks)

02. Consider the following frequency distribution which shows the monthly communication expenses of 150 university students.

Monthly communication expenditures (in rupees)	No of students
0-100	05
101-200	06
201-300	10
301-400	15
401-500	19
501-600	30
601-700	25
701-800	18
801-900	13
901-1000	09

- i. Construct the histogram and the frequency polygon for the above data. (4 marks)
- ii. Find the mean monthly communication expenditure. (4 marks)
- iii. How much of money spend for communication by the highest number of students? (4 marks)
- iv. Calculate the standard deviation of their expenses. (2 marks)
- v. How much is the least amount paid by the highest 10% expenditure category. (2 marks)

03. i. Describe the difference between discrete and continuous random variables. (4 marks)
- ii. Three students will be selected randomly from a group of students consist of 3 English medium and 7 Sinhala medium students. The random variable X denotes the number of Sinhala medium students selected.
- Draw the sample space for the above event. (2 marks)
 - Construct the probability distribution of variable X. (2 marks)
 - Find the expected value of X. (2 marks)

- iii. If X has a probability density function

$$f(x) = \begin{cases} k \cdot e^{-2x} & \text{for } x > 0 \\ 0 & \text{elsewhere} \end{cases}$$

Find

- K (2 marks)
- $P(0.5 \leq X \leq 1)$ (2 marks)
- Expected value of X. (2 marks)

04. i. What is a Bernoulli experiment? Explain with examples. (2 marks)

- ii. The probabilities of a student passing an exam with different grades are as follows.

with A grade 25%

With C grade 20%

with B grade 50%

With less than C grade 5%

If 20 students selected randomly, find the following probabilities of passing the exam using binomial distribution.

- 4 students with A grade (2 marks)
- No students with less than C grade (2 marks)
- 3 to 5 students with C grade (2 marks)
- 15 students with B or more grade. (2 marks)

- iii. Suppose X is a random variable and it is given as $X \sim N(55, 9)$. Find the following probabilities

- $P(X > 57)$ (2 marks)
- $P(X < 52)$ (2 marks)
- $P(50 < X < 60)$ (2 marks)

05. i. Explain briefly the sampling distribution of sample mean? (3 marks)
- ii. Explain the importance of the Central Limit Theorem in statistics. (4 marks)
- iii. The mean amount that a university student spend for food is Rs. 200 per day with the standard deviation of 50 rupees. If 150 students were selected randomly, find their mean food expenditure is,
- a. Higher than 190 (3 marks)
 - b. Lower than 195 (3 marks)
 - c. Between 185 and 210 (3 marks)
06. i. Identify the difference between point and interval estimation. (4 marks)
- ii. How do you identify a good point estimator? (4 marks)
- iii. How probability associates with the interval estimation? (4 marks)
- iv. A random sample of hundred households in a city states that their mean monthly electricity bill is Rs.2550 with the variance of 625. Find the interval estimation for the mean monthly household electricity expenditure for the entire city under 95% confidence level. (4 marks)
07. i. A Government spokesman said that the weekly depreciation of Sri Lankan rupee over US dollars is 5%. By looking at the data for the past 10 weeks it was found that the weekly depreciation is 7% with the standard deviation of 0.5%. At 5% significance level, test whether the government spokesman's statement is true? (4 marks)
- ii. Write short notes on the following topics (3 marks each)
- a. Null and Alternative Hypothesis
 - b. Level of significance
 - c. Test statistics
 - d. One tail test and two tail tests
