



**UNIVERSITY OF PERADENIYA
CENTRE FOR DISTANCE AND CONTINUING EDUCATION**

ශාස්ත්‍රපරීක්ෂණ ප්‍රසාද (බාහිර - නව නිර්දේශය-පරීක්ෂණය 100 මට්ටම - October 2025
கலைத்தேர்வுப் பரீட்சை (வெளிவாரி-புதிய பாடத்திட்டம்) 100 வது தேர்ச்சி மட்டம் - ஓக்டோபர் 2025
Bachelor of Arts (External - New Syllabus) Examination 100 Level –October 2025

SUPE 107: Introduction to Statistics

කාලය පැය (03) තුනයි.

நேரம்: மூன்று (03 மணித்தியாலங்கள்)

Time: three (03) Hours.

පරීක්ෂණ 04 කට පිළිතුරු සපයන්න.

04 வினாக்களுக்கு மட்டும் விடையளிக்க.

Answer 04 questions only.

නොපැහැදිලි අත් අකුරුවලට ලකුණු කපනු ලැබේ.

எழுத்து தெளிவில்லாதவிடத்து புள்ளிகள் குறைக்கப்படும்.

Marks will be deducted for illegible handwriting.

මෙම පරීක්ෂණ පත්‍රයේ අඩංගු පරීක්ෂණ සංඛ්‍යාව 07 කි.

இந்த வினாப்பத்திரத்தில் 07 வினாக்கள் உள்ளன.

There are 07 questions in the question paper.

1.
 - a) Differentiate between descriptive and inferential statistics with (08 Marks) examples.
 - b) Explain the levels of measurement (nominal, ordinal, interval, and ratio) (10 Marks) and discuss their importance in data analysis.
 - c) Discuss the limitations of statistics as a tool in social science research. (07 Marks)
2.
 - a) What are the methods of collecting data? Explain. (10 Marks)
 - b) Distinguish between closed-end questions and open-ended questions? (07 Marks)
 - c) Discuss the steps in questionnaire construction. (08 Marks)
3. The marks (out of 100) obtained by 50 students in a test are given below:

65	36	92	45	22	85	48	32	96	70
53	15	80	42	56	90	63	46	27	75
73	95	60	38	68	84	25	74	35	66
62	40	44	18	100	94	12	50	55	86
78	72	30	88	52	57	76	58	82	98

- a) Using a suitable method, construct a frequency distribution table for the marks (choose class intervals of width 10). Include frequency, cumulative frequency, and class midpoints. (07 Marks)
- b) Using the frequency table, calculate the mean and median of the data. (06 Marks)
- c) Calculate the quartiles (Q1, Q2, Q3) of the above data and prove that the median = Q2. (06 Marks)
- d) Calculate the standard deviation of the data using the frequency table. (06 Marks)

4.
 - a) What do you mean by a confidence interval? State the general formula for constructing a confidence interval for the mean of a normal population. (05 Marks)
 - b) A random sample of 15 university students has an average weekly expenditure of Rs. 2,850 with a sample standard deviation of Rs. 300. (08 Marks)
 - i. Estimate the population mean weekly expenditure with a 95% confidence level.
 - ii. Find the 99% confidence interval for the same data.
 - iii. Explain why the 99% interval is wider than the 95% interval.
 - c) The average monthly salary of lecturers in a certain faculty is estimated to be Rs. 160,000. A sample of 12 lecturers gave a mean of Rs. 155,000 with a standard deviation of Rs. 12,000. Construct a 95% confidence interval for the true mean salary and state whether the faculty claim appears reasonable. (07 Marks)
 - d) If a researcher wants to estimate the average age of students with a margin of error not exceeding 1 year and a confidence level of 95%, and the population standard deviation is known to be 3.5 years, find the minimum sample size required. (05 Marks)
5.
 - a) What do you mean by 'level of significance' in testing a hypothesis? (04 Marks)
 - b) Explain the difference between Type I and Type II errors with suitable examples. (04 Marks)
 - c) Explain the difference between one-tailed test and two-tailed test. (04 Marks)
 - d) A soft drink company claims that its bottles contain an average of 500 ml of drink. A sample of 10 bottles shows a mean content of 495 ml and a standard deviation of 8 ml. At the 5% level of significance, test whether the company's claim is valid. (08 Marks)
 - e) State the null and alternative hypotheses for the following statement: "The average number of study hours per week of university students exceeds 25 hours." (05 Marks)
6.
 - a) Probability plays a vital role in the day to day life. Explain 4 applications of probability theory in real life. (08 Marks)
 - b) Describe the concept of the random experiment. (07 Marks)
 - c) The following table describes the relationship between the educational level of a factory's 1000 employees and the gender : (06 Marks)

	High school	Bachelor	Master	PhD
Male	0.2	0.15	0.1	0.07
Female	0.15	0.2	0.08	0.05

Suppose an employee is selected at random

- i. What is the probability that the selected person is a female and a master's degree holder?
 - ii. What is the probability that the selected person is a male?
 - iii. If the selected person is female, what is the probability that she has a PhD.
- d) Suppose that $P(A) = 0.7$, $P(B) = 0.5$, and $P(A \cup B)' = 0.1$ (04 Marks)

Find

- i. $P(A \cap B)$
- ii. $P(A|B)$ and
- iii. $P(\bar{B}|A)$

7. a) Write short notes on the following (05 Marks each)
- i. Quantitative data and Qualitative data
 - ii. Mutually exclusive events and Independent events
 - iii. Primary data and Secondary data
 - iv. Discrete and Continuous variables
 - v. Kurtosis and Skewness of a distribution

