

THE OPEN UNIVERSITY OF SRI LANKA
FACULTY OF HEALTH SCIENCES
DEPARTMENT OF PSYCHOLOGY & COUNSELLING
ACADEMIC YEAR 2022/2023- SEMSETER II



BSC HONS IN PSYCHOLOGY
PLU 4303 - INTRODUCTION TO STATISTICS IN PSYCHOLOGY- LEVEL 4
CONTINUOUS ASSESSMENT TEST – NBT I
DURATION: 1 ½ HOURS

DATE: 06.06.2023

TIME: 11.30AM-1.00PM

INDEX NO:

IMPORTANT INSTRUCTIONS/ INFORMATION TO CANDIDATES

- This question paper consists of **07 pages** with **04 Short Answer Questions (100marks)**
- Write your INDEX NO in the space provided.
- **Problem-Based Questions:** Write the answer within the space provided.
- Do **NOT** remove any page/part of this question paper from the examination hall.
- Do **NOT** keep unauthorized materials, including mobile phones and other electronic equipment, with you during the examination.
- **Calculators are allowed.**

Short Answer Questions

01. A lecturer has conducted a lecture on basic concepts in identifying variables. Write the answers for the following questions related to the above topic.
- i. Classify the following variables as qualitative or quantitative. (05 marks)
- a) Number of days in a year -
 - b) BMI value -
 - c) Genotype -
 - d) Vital Status -
 - e) Temperature -
- ii. Write two examples for discrete variable. (04 marks)
- 1.
 - 2.
- iii. Name the scale of measurement of the following variables. (04 marks)
- a) Ethnicity -
 - b) Age -
 - c) IQ Score-
 - d) Language ability (e.g., beginner, intermediate, fluent)-
- iv. Write the variable type (independent, dependent or control) that matches with the following definitions. (06 marks)
- a) The variable which is kept the same throughout the experiment -
 - b) The variable which is the experimenter manipulates or changes-
 - c) The variable which is changed based on the other variable/s-
- v. Write three examples for central tendency measurements. (06 marks)
- 1.
 - 2.
 - 3.

02. The marks obtained in the Statistics test by a class of 20 students are summarized in the frequency table in given below. Answer the following questions based on the summarized data.

i. Complete the following frequency table.

(09 marks)

Marks	Frequency	Cumulative Frequency	Percentage	Cumulative Percentage
5	3			
6	3			
7	5			
8	2			
9	4			
10	3			

ii. Calculate the mean value of the Statistics marks.

(03 marks)

iii. What is the mode value of the statistics marks?

(02 marks)

iv. What is the range of this data set?

(02 marks)

- v. Sketch a histogram to show the distribution of the statistics marks. (05 marks)
- vi. The variance of statistics marks is given as 2.75. Calculate the coefficient of variance (CV). (04 marks)
03. Considering the basic concepts in hypothesis testing, write the answers for the following questions.
- i. What is the inferential statistic? (02 mark)
- ii. Define the term “sample”? (02 mark)

iii. What is a hypothesis?

(02 mark)

iv. Write steps in hypothesis testing.

(03 marks)

v. What is alternative hypothesis?

(02 marks)

vi. Briefly explain the difference between a parametric test and a non-parametric test.

(02 marks)

Parametric test:

Non-Parametric test:

- vii. Write down the hypothesis for the population mean using standard notation for the following scenarios and state whether it is one-tailed test (left-tailed or right-tailed) or two-tailed test

(09 marks)

(Consider the standard notations of the two-population means are μ_A and μ_B)

Scenario	Null hypothesis (H_0)	Alternative hypothesis (H_1)	Is it left-tailed, right-tailed or two-tailed test?
1) To check whether the mean of population A is less than to population B	a)	b)	c)
2) To check whether the mean of population A is different from population B	d)	e)	f)
3) To check whether the mean of population A is greater than to population B	g)	h)	i)

- viii. What are the three approaches that can be used to make the decision on hypothesis testing.

(03 marks)

04. A researcher wants to test whether the mean systolic blood pressure of hypertensive patients is different from that of the normal value. He randomly selected 100 hypertensive patients from a hospital and their average systolic blood pressure was measured as 150 mmHg. (Normal systolic blood pressure is 120 mmHg and Standard deviation is 40 mmHg). Assuming the systolic blood pressure of hypertensive patients are normally distributed, answer the following questions.

- i. State the hypotheses to be tested.

(04 marks)

(Consider the standard notations of the population mean is μ)

H_0 :

H_1 :

ii. Z-test is selected to test the above hypothesis by the researcher. Give the reason for the selection of the Z-test. (03 marks)

iii. Identify the values for the following statistics from the above given scenario. (Note: Standard notations have been used) (08 marks)

\bar{X}	μ_0
σ	n

iv. Find the Z-test value using the following equation. (04 marks)
(Note: Standard notations have been used)

$$Z = \frac{\bar{x} - \mu_0}{\sigma/\sqrt{n}}$$

v. Write the decision rule to check the above claim. (03 marks)

vi. What is the conclusion of the test at the 5% significance level? (Consider: at the 5% significance level critical value is 1.96) (03 marks)

