JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF HEALTH SCIENCES

UNIVERSITY EXAMINATION FOR DEGREE OF BACHELOR OF SCIENCE PUBLIC HEALTH / COMMUNITY HEALTH AND DEVELOPMENT

2ND YEAR 2ND SEMESTER 2023/2024 ACADEMIC YEAR

MAIN

COURSE CODE: SBB 1312

COURSE TITLE: BIOSTATISTICS I

EXAM VENUE: **STREAM: (BSc. Env. Hlth/ Comm Hlth & Dev)**

DATE: **EXAM SESSION:**

TIME: 2.00 HOURS

Instructions:

1. **Answer all the questions in Section A and ANY other 2 questions in Section B.**
2. **Candidates are advised not to write on the question paper.**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room.**

SECTION A

Answer all questions (30 Marks)

Question 1

Differentiate between descriptive and inferential statistics. Give examples of situations where each is applied. **[2 Marks]**

Question 2

Define the term "histogram" and explain its significance in data visualization. **[2 Marks]**

Question 3

Calculate the median and mode of the following dataset: 6, 8, 10, 10, 12, 14, 16, 18, 20. **[2 Marks]**

Question 4

Define the concept of measures of central tendency and provide examples of three different measures. **[3 Marks]**

Question 5

Calculate the range, variance, and standard deviation for the following dataset:

12, 18, 22, 28, 36, 40, 46 **[6 Marks]**

Question 6

a. Explain the steps involved in hypothesis testing. Provide a real-life example where hypothesis testing (e.g., one-sample t-test, ANOVA, chi-square) is applicable. **[4 Marks]**

b. Perform a one-sample t-test on a dataset provided, and interpret the results. **[3 Marks]**

15 24 13 10 19 11 20 14 22 12

Question 7

Discuss the importance of percentiles in statistics. How are percentiles useful in understanding data distributions? **[3 Marks]**

Question 8

In a clinical trial, you have data on the effectiveness of a new drug for a specific condition. Explain the process of hypothesis testing you would use to determine whether the drug is significantly more effective than a placebo. **[2 Marks]**

Question 9

Describe the concept of range and interquartile range as measures of dispersion. Calculate the range and interquartile range for the following dataset: 12, 15, 18, 20, 22, 25, 28. **[3 Marks]**

SECTION B: ANSWER ANY TWO QUESTIONS

Question ONE

(a) Describe four Scales of Measurement citing appropriate variables that can be measured using each scale. (10mks)

(b)Define the following terms as used in Biostatistics:

(i) Variability (2mks)
(ii) Bias (2mks)
(iii)Data Triangulation (2mks)

(c)Distinguish between the following Biostatical terms.

(i) Validity and Reliability (2mks)
(ii) Reproducibility and Repeatability (2mks)

Question TWO

(f) The frequency Distribution Table below shows the height of 50 students in a Biostatistics class at Jaramogi Oginga Odinga University of Science and Technology.

Height (cm)	Frequency
135-139	5
140-144	4
145-149	2
150-154	12
155-159	15
160-164	4
165-169	5
170-175	3

(i) Estimate the Mean Height. (3mks)
(ii) Estimate the Mode (4mk)
(iii)Estimate the Median Height (4mks)
(iv)What are the limitations of using mean as a measure of central tendency (4mks)
(v) The pulse rate of a group of normal healthy males was 72, with a standard deviation of 2. What is the probability that a male chosen at random would be found to have a pulse rate of 80 or higher? (3mks)

Question THREE

(f) The weight of class four children in a certain school were presented in Frequency table below.

Weight in (Kg)	22-24	25-27	28-30	31-33	34-36	37-39	40-42	43-45	46-48
Frequency	6	22	35	16	12	8	4	5	2

(i) Represent the data in the graph of your choice. Explain your choice. (6mks)

(ii) Calculate the Range, Interquartile Range, Standard deviation and coefficient of Variation. (14mks)

Question FOUR

(i) The mean weight at birth of a sample of student in Bondo Sub-county Hospital was found to be 2.6kg with a standard Deviation of 0.68kg. Determine the 95% confidence interval for the true mean weight of babies in that population. (5mks)

(ii) The following data represent the Hemoglobin Value in gm/dl for 10 patients:

10.5 9 6.5 8 11 7 7.5 8.5 9.5 12

Is the mean Value for Patient Significantly different from the mean value of the general population of 12gm/dl? (15mks)