



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF HEALTH SCIENCES
**UNIVERSITY EXAMINATION FOR BACHELOR OF SCIENCE PUBLIC HEALTH/
COMMUNITY HEALTH AND DEVELOPMENT**
3RD YEAR 1ST SEMESTER 2023/2024 ACADEMIC YEAR
MAIN CAMPUS

COURSE CODE: SBB 1409

COURSE TITLE: BIOSTATISTICS II

EXAM VENUE: STREAM: (BSc. Env. Hlth/ Com. Hlth. Dvpt)

DATE: EXAM SESSION:

TIME:

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 consists of 10 multiple-choice Question (MCQ) and amounts to 10 marks.

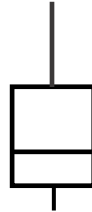
Section B consists of 4 short answer questions (SAQ) totalling to 20 marks.

Section c consists of 3Long essay questions (SAQ) totalling to 40 marks.

Section A, Answer all questions in this section

1. A sample of 400 Regina households is selected and several variables are recorded. Which of the following statements is correct? **[1mark]**
 - A. Total household income (in KSH) is an interval level data.
 - B. Socioeconomic status (recorded as “low income”, “middle income”, or “high income” is nominal level data.
 - C. The number of people living in a household is a discrete variable.
 - D. The primary language spoken in the household is ordinal level data.
 - E. None of the above

2. What term would best describe the shape of the given boxplot: **[1mark]**
 - A. Symmetric
 - B. Negatively skewed
 - C. Positively skewed
 - D. Normal curve
 - E. None of the above

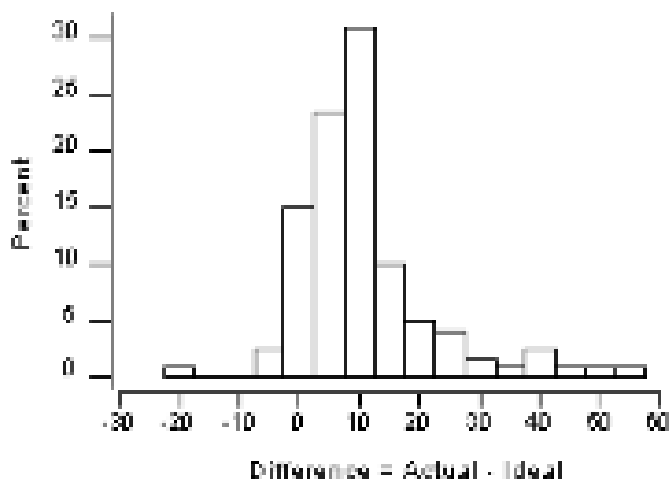


Note: Questions 3 and 4 are based on the following sample of ages (in months) of 18 children at a day care: 36, 42, 18, 32, 22, 22, 25, 29, 30, 31, 19, 24, 35, 29, 26, 36, 24, 28

3. What is the standard deviation of the age of children? **[1mark]**
 - A. 38.95
 - B. 41.24
 - C. 6.24
 - D. 6.42
 - E. 41.44
4. The median age of the children is? **[1mark]**
 - A. 29
 - B. 28.2
 - C. 30.5
 - D. 28.5
 - E. 31
5. What is one of the distinctions between a population parameter and a sample statistic?
 - A. A population parameter is only based on conceptual measurements, but a sample statistic is based on a combination of real and conceptual measurements. **[1mark]**
 - B. A sample statistic changes each time you try to measure it, but a population parameter remains fixed.
 - C. A population parameter changes each time you try to measure it, but a sample statistic remains fixed across samples.
 - D. The true value of a sample statistic can never be known but the true value of a population parameter can be known.

6. A magazine printed a survey in its monthly issue and asked readers to fill it out and send it in. Over 1000 readers did so. This type of sample is called **[1mark]**
- a cluster sample.
 - a self-selected sample.
 - a stratified sample.
 - a simple random sample.
7. Which one of these statistics is unaffected by outliers? **[1mark]**
- Mean
 - Interquartile range
 - Standard deviation
 - Range

Question 8 to 10: The following histogram shows the distribution of the difference between the actual and “ideal” weights for 119 female students. Notice that percent is given on the vertical axis. Ideal weights are responses to the question “What is your ideal weight”? The difference = actual – ideal. (Source: idealwtwomen dataset on CD.)



8. What is the approximate shape of the distribution? **[1mark]**
- Nearly symmetric.
 - Skewed to the left.
 - Skewed to the right.
 - Bimodal (has more than one peak).
9. The median of the distribution is approximately **[1mark]**
- 10 pounds.
 - 10 pounds.
 - 30 pounds.
 - 50 pounds.
10. Most of the women in this sample felt that their actual weight was? **[1mark]**
- About the same as their ideal weight.

- B. Less than their ideal weight.
- C. Greater than their ideal weight.
- D. No more than 2 pounds different from their ideal weight

Section B: Answer all questions in this section

1. A study is conducted concerning the blood pressure of 60-year-old women with glaucoma. In the study 200 60-year-old women with glaucoma are randomly selected and the sample mean systolic blood pressure is 140 mm Hg and the sample standard deviation is 25 mm Hg. Calculate a 95% confidence interval for the true mean systolic blood pressure among the population of 60-year-old women with glaucoma. [5 marks]
2. There are 2.5 million people aged 75-84 in Country X, which has a total population of 25 million. 4000 people died of influenza and pneumonia in Country X in 2011. 2,540 of these deaths occurred in the 75-84 age group. What is the 2011 mortality rate for influenza and pneumonia among people in Country X aged 75-84? [5 marks]
3. Briefly discuss the following types of analysis [5 marks]
 - A. Bivariate analysis
 - B. Multivariate analysis
4. With one example each, Define type I and type II errors [5 marks]

Section C: Answer any two questions in this section

1. Suppose 10 Children from Maseno nursery school are randomly picked and their heights measured. Their heights in inches are 46, 43, 40, 42, 39, 44, 41, 43, 45, and 40
 - A. What is the definition of 95% CI? [4 Marks]
 - B. Calculate the following
 - I. Standard deviation [5 marks]
 - II. Standard error of the mean [5 marks]
 - III. 95 % CI of the mean [6marks]
2. With examples, briefly discuss the following types of bias [20 marks]
 - A. Selection bias
 - B. Information bias
3. Normally distributed IQ scores has a mean of 100 and standard deviation of 15. Use the standard Z-score table to answer the following questions [20 marks]

What is the probability of randomly selecting someone with IQ score that is?

 - A. Less than 80
 - B. Greater than 136
 - C. Between 95 and 110
 - D. What IQ score corresponds to the 90th Percentile
 - E. The middle 30% of IQ fall between what values?

Note: Standard Normal Cumulative Probability Table will be provided