



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE & TECHNOLOGY**  
**SCHOOL OF BIOLOGICAL, PHYSICAL, MATHEMATICS AND ACTUARIAL**  
**SCIENCES**

**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE**  
**IN BIOLOGICAL SCIENCES**

**3<sup>rd</sup> YEAR 1<sup>st</sup> SEMESTER 2022/2023 ACADEMIC YEAR**

**MAIN CAMPUS - REGULAR**

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**COURSE CODE: SBB 1312**  
**COURSE TITLE: BIostatISTICS**  
**EXAM VENUE: STREAM: (BSC)**  
**DATE: 21/12/2022 EXAM SESSION: 15.00-17.00PM**  
**TIME: 2 HOURS**

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**Instructions:**

- 1. Answer ALL questions in Section A and Any two questions in Section B**
  - 2. Candidates are advised not to write on question paper**
  - 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**
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## SECTION A: SHORT ANSWER QUESTIONS (30 MARKS)

1. Citing examples, define the following data types:
  - a) Nominal (1 mark)
  - b) Ordinal (1 mark)
  - c) Categorical (1 mark)
2. Describe the data types summarised using the techniques below: (3 marks)
  - a) Stem and leaf plot
  - b) Histogram
  - c) Scatter plot
3. Contrast left skewed and right skewed data sets (3 marks)
4. Distinguish between point and interval estimates (3 marks)
5. State the hypothesis when comparing two sample means for the following scenarios:
  - a) Two tailed tests (1 mark)
  - b) Left tailed test (1 mark)
  - c) Right tailed test (1 mark)
6. Describe the application of  $z$  and  $t$  distributions in single means comparisons (3 marks)
7. List the different types of  $t$  tests (3 marks)
8. Describe the application of a paired sign test (3 marks)
9. Describe the goodness of fit test and give an example of a dataset that can be analyzed using it (3 marks)
10. A scientist is interested in finding out the abundance of malaria vectors in houses within Bondo sub-county. Giving reasons, describe what would be the scientist's:
  - a) Target population (1.5 marks)
  - b) Sampling unit (1.5 marks)

## SECTION B: ESSAY QUESTIONS (40 MARKS)

11. Give an outline on the use of One-way analysis of variance in comparing the means of three populations (20 marks)
12. Discuss different sampling methods used in scientific research (20 marks)
13. A comparative study on the weight of two varieties of a fruit gave the following results:  
Variety A: 43, 42, 34, 48, 38, 36, 41, 43, 28, 39, 37, 39, 35, 34, 30  
Variety B: 10, 12, 12, 13, 14, 14, 14, 14, 15, 16, 17, 17, 18, 18, 20
  - a) Perform a statistical test to compare if the difference in weight between the two groups is significant (14 marks)
  - b) Use a boxplot to summarize the difference in weight between the two groups (6 marks)
- 14) A study was conducted to test the relationship between Age and diastolic blood pressure in a group of 15 patients. The results are indicated below.

Age	46	47	45	53	56	50	56	57	60	63	64	62	70	68	68
DBP	123	120	120	133	135	130	135	141	138	141	141	141	152	151	151

- a) Determine if there is a correlation between the age and diastolic blood pressure (12 marks)
- b) Determine the equation of the regression line (8 marks)