



# **MASENO UNIVERSITY**

## **UNIVERSITY EXAMINATIONS 2017/2018**

### **FIRST YEAR SECOND SEMESTER EXAMINATIONS FOR THE DEGREE OF MASTER OF SCIENCE IN BOTANY (MICROBIOLOGY AND PLANT PATHOLOGY)**

#### **MAIN CAMPUS**

#### **SBT 802: BIOMETRY, EXPERIMENTATION AND METHODOLOGY**

Date: 15<sup>th</sup> February, 2018

Time: 12.00 - 3.00pm

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#### **INSTRUCTIONS:**

- Answer ALL Questions in Section A and any other THREE from Section B.



## SECTION A: COMPULSARY QUESTIONS [15 MARKS EACH]

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1. In an experiment to examine the effect of glucose concentration in the medium on linear growth of a fungus the following results were obtained for a medium containing mineral nutrients plus glucose at 50 mg per litre.

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Days from inoculation	3	5	7	9	11	13
Radius of colony (mm)	7.7	13.0	17.5	23.0	26.7	29.7

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Plot these results as a scatter diagram, examine the regression of colony diameter on time and attach 95% confidence limits to b, the linear growth rate.

2. Discuss Measures of Central Tendency

## SECTION B: ANSWER ANY THREE QUESTIONS [10 MARKS EACH]:

3. Discuss Statistics and the Scientific Method of investigation.
4. Discuss Random Samples in data Collection.
5. Discuss the following as relates to experimental design.
- a) Choice of Treatments
  - b) Randomization

6. To develop a new sanitary engineering technique, amounts of hydrogen sulfide produced from sewage after 42 hours at 37°C for nine runs were collected and are presented in the table below.

Hydrogen sulfide produced in anaerobic fermentation of sewage after 42 hours at 37°C

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Run	1	2	3	4	5	6	7	8	9
H <sub>2</sub> S	210	211	218	228	220	227	223	224	192

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Calculate:

- a) Mean
- c) Variance
- d) Standard deviation
- e) Standard Error
- f) Coefficient of variability

f) Explain the relevant information that can be drawn from the analysis.

7. Discuss error control in experiments.