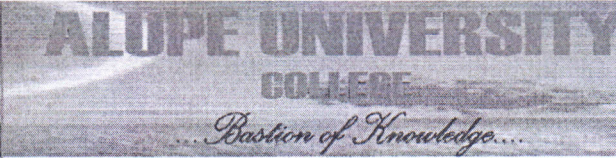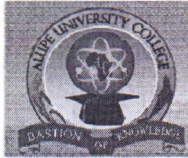**ALUPE UNIVERSITY COLLEGE**
...Bastion of Knowledge...

P. O.Box 845-50400 Busia(K)
principal@auc.ac.ke
Tel: +254 741 217 185
+254 736 044 469
*off Busia-Malaba road*

**OFFICE OF THE DEPUTY PRINCIPAL**
**ACADEMICS, STUDENT AFFAIRS AND RESEARCH**

# UNIVERSITY EXAMINATIONS

# 2017/2018 ACADEMIC YEAR

### FIRST YEAR FIRST SEMESTER EXAMINATION

## FOR THE DEGREE OF BACHELOR

## OF SCIENCE IN MICROBIOLOGY

**SCHOOL:** SCIENCES

**COURSE CODE:** STA 110

**COURSE TITLE:** INTRODUCTION TO

STATISTICAL ECONOMICS

**DATE:** 18th December, 2017 **TIME:** 2.00pm-5.00pm

**INSTRUCTION TO CANDIDATES:** SEE INSIDE

**THIS PAPER CONSISTS OF 22 PRINTED PAGES**     PLEASE TURN OVER

For examiner's Use Only

| Question | I.E | E.E |
|---|---|---|
|  |  |  |
| CAT |  |  |
| EXAM |  |  |
| TOTAL |  |  |

Insert the numbers of the questions you have answered in the order done

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |

Student Admission No............................Exam Card No....................Signature............

## INSTRUCTIONS TO CANDIDATES

1. Write your **Admission Number, Exam Card Number** and **Sign** in the spaces provided at the bottom of each page of the Examination Booklet. DO NOT write your name anywhere in this booklet.

2. Write on both sides of the pages.

3. All rough work must be done in the Answer sheets and crossed through.

4. If supplementary pages are used, they must be fastened all together at the end of this Booklet. Supplementary pages should be used only after all the leaves in the booklet have been exhausted.

5. It is a serious examination offence to cheat or to have unauthorized materials including **MOBILE PHONES** (whether on or off) in the examination venue.

6. In no circumstances must Answer Booklet used or unused, be removed from the examination room by a candidate.

7. The Booklet is for **Examination use only** in a designated examination room. Unauthorized possession of the Answer sheets by a student or any other person constitutes an examination irregularity calling for stiff disciplinary action.

8. Do not pluck any page from this Booklet. Any extra/unused answer sheets should be returned to the **Examination Office.**

9. Candidates who come to examination room 30 minutes late will not be allowed to sit for the exam.

10. Candidates will not be allowed to leave the exam room once the exam commences.

11. Candidates are advised that importance is attached by examiners to accuracy and clarity of expression.

12. Committing any form of irregularity is prohibited and shall attract severe disciplinary action in accordance with Alupe University College Examination Regulations.

Student Admission No...............................Exam Card No.....................Signature............

**INSTRUCTION TO CANDIDATES**

Answer **ALL** questions from section A and any **THREE** from section B.

Illustrate your answers with suitable diagrams wherever necessary.

Duration of the examination: 3 hours

=========================================================

## SECTION A (31 MARKS)

### QUESTION ONE (16 MARKS)

a) Define the following terms
    i)    Census                                                [1mk]
    ii)   Sample                                                [1mk]
    iii)  Lottery method                                        [1mk]
    iv)   Sampling                                              [1mk]
    v)    Population                                            [1mk]

b)   Distinguish between discrete and continuous random variable          [2 mks]

c)   The data given below shows the final marks in mathematics of 80 students at Ufanisi secondary school. By selecting convenient classes, arrange the marks into a frequency distribution table.  Where the number of classes (K) =10.          [5 mks]

68,84,75,82,68,90,62,88,76,9373,79,88,73,60,93,71,59,85,75,61,65,57,87,74,62,95,78,63,72,66,78,82,75,94,77,69,74,68,60,96,78,89,61,75,95,60,79,83,71,79,62,67,97,78,85,76,65,71,75,65,80,73,57,88,78,62,76,53,74,86,67,73,81,72,63,76,75,85,77.

d)   Compute the mean of values 307,320,325,341,315,319 given Assumed mean=320.     [4mks]

### QUESTION TWO (15 MARKS)

(a) What do you understand the term statistics.                            [1Mk]

(b) Find the quartile deviation of the daily wages in (£) of 9 persons given as in 32, 30,28,35,33,37,33,34, and 32.                                           [3Mks]

(c) The following contents of data were recorded from each of the 30 packets of washers considered under a study: 28, 31, 29, 27, 30, 29, 29, 26, 30, 28, 28, 29, 27, 26, 32, 28, 32, 31, 25, 30, 27, 30, 29, 30, 28, 29, 31, 27, 28, and 28.

Construct the frequency distribution table and obtain                      [1Mk]

(i)    Mean                                                                          [1Mk]

(ii)   Mode                                                                          [2Mks]

(iii)  Median                                                                        [2Mks]

(iv)   Standard deviation                                                            [2Mks]

(d)    The average weight of the following distribution is 58.5kg. Find the value of $x$.   [3Mks]

| Weight (kg) | 50 | 55 | 60 | $x+12.5$ | 70 | Total |
|---|---|---|---|---|---|---|
| No. of men | 1 | 4 | 2 | 2 | 1 | 10 |

## SECTION B (31 MARKS)

**Answer any THREE questions. All Questions carry equal marks**

## QUESTION THREE (13 MARKS)

a)  Find the mean absolute deviation of the data below.                              [3mks]

| Number of accidents (x) | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|
| Number of days  (f) | 3 | 12 | 18 | 12 | 3 |

b) Draw an ogive for the following data and use it to find the values of $Q_1, Q_2$, and $Q_3$.

[6mks]

| Class interval | 101-110 | 111-120 | 121-130 | 131-140 | 141-150 | 151-160 | 161-170 | 171-180 | 181-190 |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | 6 | 17 | 18 | 96 | 150 | 100 | 57 | 21 | 5 |

c)  Calculate geometric mean of the following data.                                  [4mks]

| Number of accidence (x) | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|
| Number of days  (f) | 2 | 22 | 29 | 24 | 7 | 8 | 6 | 2 |

Student Admission No…………………………Exam Card No…………………Signature…………

## QUESTION FOUR (13 MARKS)

a) Find the mean, median and mode of the following data. Also obtain the three quartiles.

[13mks]

| Students marks | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85-89 | 90-94 | 95-99 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. of students | 12 | 6 | 16 | 7 | 10 | 15 | 20 | 6 | 4 | 1 | 7 | 3 | 4 | 8 | 6 | 5 |

## QUESTION FIVE (13 MARKS)

a) The following table shows the lengths of 40 leaves recorded to the nearest mm.

138,164,150,132,144,123,149,157,146,158,140,147,136,148,152,144,168,126,138,126,

163,119,154,165,136,173,142,147,135,153,140,135,161,145,135,142,150,156,145,128

Construct

i) Frequency distribution                                    [4mks]

ii) Histogram                                                [2mks]

iii) Frequency polygon                                       [2mks]

iv) Ogive [2mks]

v) How many leaves have lengths less than 152mm             [1mk]

vi) What percent of the leaves have lengths higher than 140 but not more than 154 mm.

[2mks]

## QUESTION SIX (13 MARKS)

a) The monthly wages paid to the workers in two firms A and B belonging to the same industry gives the following results

|  | FIRM A | FIRM B |
|---|---|---|
| **Number of workers** | 500 | 1000 |
| **Average monthly wages (Mean)** | 250 | 200 |
| **Variance** | 100 | 144 |

i)    Calculate combined mean for firm A and firm B.              [2mks]

ii)   Calculate combined variance for firm A and firm B.          [3mks]

Student Admission No…………………………Exam Card No…………………….Signature…………

b) In a study to investigate growth of plants, the following data was recorded.

| Height(cm) | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 |
|---|---|---|---|---|---|
| No. of plants | 8 | 15 | 20 | 4 | 3 |

Calculate the harmonic mean.                                    [3mks]

c) List and explain five characteristics of a good average?          [5mks]

## QUESTION SEVEN (13 MARKS)

a) Define the following terms; qualitative and quantitative data, give examples of each? [4mks]

b) List two merits and demerits of median as a good measure of central tendency?     [4mks]

c) Give and explain five an area in which statistic is applicable.    [5mks]