MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2016/2017

SECOND YEAR FIRST SEMESTER EXAMINATION FOR DEGREE OF BACHELOR OF SCIENCE IN FISHERIES AND AQUACULTURE AND BACHELOR OF SCIENCE INAQUATIC RESOURCES CONSERVATION & DEVELOPMENT WITH INFORMATION TECHNOLOGY

MAIN CAMPUS

AFN 207: INTRODUCTORY BIOSTATISTICS

Date: 5th December, 2016

Time: 12.00 - 3.00pm

INSTRUCTIONS:
- Answer ALL Questions in Section A and any other TWO in Section B.
- Observe further instructions on the question paper.

IMPORTANT INFORMATION:

*Candidates can use electronic calculators with **no alarms on**. Candidates **ARE NOT ALLOWED to use mobile phones**. Any candidate found with mobile phones in the examination room will be dealt with in accordance with the examinations regulations of Maseno University.*

FURTHER INSTRUCTIONS

1. Answer ALL the questions in section "A" (40 marks) and any TWO questions from section "B" (30 marks).
2. Illustrate answers with labeled diagrams whenever appropriate.
3. Any illustrations in response to data provided in the question booklet must be drawn to scale.
4. You are required to show ALL work clearly and methodically.

SECTION A (40 marks)

Answer all the questions in this section

Q1 (a). Give a brief statement on the role of statistics in scientific inquiry (2 marks)

(b). From scientific research and statistics concepts, distinguish between the following:

(i). Null hypothesis and alternate hypothesis (2 marks).

(ii). Type I error and type II error (2 marks).

Q2. State the various statistical factors collectively known as:

(a). indicators of central tendency (3).

(b). measures of variation (3).

Q3 Use the following data quantities $x_1, x_2, \ldots, x_n$ to determine;.

(a). an appropriate information on the data center (3 marks).

(b). an appropriate information about the data distribution (5 marks).

Q4 (a). Explain when and when not to use dot-diagram in describing a data set (2 marks).

(b). During a fish-pond sampling in growth monitoring, the weights (in grams) of five fish-fingerlings were as follows: 9.2, 6.4, 10.8, 8.1, and 7.8. Present this information on a dot diagram (3 marks).

Q5 State the effect of replacing 9 with 10 in the following set of data; 5, 3, 4, 3, 9, on;

(a). the mean (1 marks)   (b). the median (1 marks)

(c). the mode (1 marks), and;   (d). the standard deviation (2 marks).

Q6 From tabled information below, you are required to:
(a). Calculate the mean deviation (2 marks).
(b). Determine the standard deviation (5 marks).

Variable	Frequency
100 - 110	2
110 - 120	6
120 - 130	12
130 - 140	30
140 - 150	33

150 - 160	10
160 - 170	5
170 - 180	2

Q7 The mean weight of three pieces of cyprinid fish, *Labeo* victorianus is 15 g whilst the mean weight of these together with another two is 28 g. If one of the later is 20 g, find the weight of the other (3 marks).

Section B (30 Marks)
Answer any <u>two</u> questions

Q8 For questions *a, b & c* that follows, use the following table.

Class	Cumulative Frequency
20 - 39	7
40 - 59	23
60 - 79	65
80 - 99	139
100 - 119	212
120 - 139	253
140 - 159	272
160 - 179	284
180 - 199	292
200 - 259	300

a). Calculate the mid class values (5 marks)

b). State the frequency of each class (5 marks)

c). Determine the arithmetic mean of this data distribution (5 marks).

Q9. (a). Use the following data set to construct grouped frequency distribution, and cumulative frequency distribution tables. Note that you may use same table with appropriate column headings. (Hint, use classes $0 - 4$, $5 - 9$, ...) (6 marks)

3 25 22 16 10 9 14 8 34 21 15 12 9 3 8 15 20 12 28 19

17 16 23 19 12 14 29 13 24 18

(b). Draw a histogram and a frequency polygon for the data (4 marks).

(c). Draw cumulative frequency polygon and give the alternative name for this type of graph (5 marks).

Q10 (a) State Chebizev's theorem and, give his formula concerning the standard deviations for any data set (5 marks).

(b). In a certain distribution of numbers, the mean is 50 and standard diversion is 6. Use Chebizev's rule to determine what percentage of numbers are:

(i). between 26 and 74 (3 marks)

(ii). between 38 and 62 (3 marks)

(iii). less than 32 or more than 68 (4 marks)