AFRICA UNIVERSITY
A United Methodist-Related Institution

"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

NACP 202: BIOMETRY

END OF SECOND SEMESTER FINAL EXAMINATIONS

APRIL 2022

LECTURER: MR. E. CHIKAKA

DURATION: 3 HOURS

INSTRUCTIONS

ANSWER **ALL** QUESTIONS IN SECTION A AND ANY **THREE (3)** FROM SECTION B

THE MARK ALLOCATION FOR EACH QUESTION IS INDICATED AT THE END OF THE QUESTION

CREDIT WILL BE GIVEN FOR LOGICAL, SYSTEMATIC AND NEAT PRESENTATION

EACH QUESTION SHOULD START ON A FRESH PAGE

SECTION A ANSWER ALL QUESTIONS [40 Marks]

QUESTION 1

What do you understand by Biometry? What are the roles of a Biometrician in your field of study? [3, 7]

QUESTION 2

Discuss the data types that know. Why is it important to know the type of data in any agriculture decision making process? [10]

QUESTION 3

The following is the distribution of Fat (percentage) in 100 samples collected from different milk centres in villages

Fat(%)	1-3	3-5	5-7	7-9	9-11
Samples	40	26	30	2	2

Compute Mean, Median, Mode, Geometric Mean and Harmonic Mean of Fat content per sample. Comment on the answers that you obtained. [10]

QUESTION 4

Distinguish between 'skewness' and 'kurtosis' in relation to their application in agricultural statistics. Compute coefficients of 'skewness' and 'kurtosis' for the following data on rainfall (cm) in the month of August at a Regional Agricultural Research Station in Manicaland Province.
2, 0, 6, 8, 13, 7, 2, 2, 4, 10, 11, 2. 0, 5, 11, 0, 0. 8, 7, 9, 6. 5, 12, 3, 4, 5, 0, 6, 1, 2, 4 [10]

SECTION B ANSWER ANY THREE (3) QUESTIONS [60 Marks]

QUESTION 4

a. The height of barley plants in a field is assumed to follow a normal distribution with mean height *35''* and standard deviation 4.0". A sample of 150 plants was selected from a plot. Find the number of plants:
   (i) having height more than 40"
   (ii) between the heights 32" and *38'*
   (iii) below the heights 30". [10]

b. List and explain all the data sources and data types you know [10]

QUESTION 5

a. What do measures of central tendency and variation indicate? Describe the important measures of central tendency and variation pointing out the situation when one measure is considered relatively appropriate in comparison to other measures. [10]

b. The average number of mango fruits per tree in a particular region was known to be 520 with a standard deviation of 4.0. A random sample of 20 trees was selected and the average number of fruits was found to be 450 per tree. Test at 5% level of significance whether the average number of fruits per tree selected in the sample is in agreement with the average production in that region? [10]

QUESTION 6

The following data represent the heights (in inches) of a random sample of 50 two-year old males.

36.0	36.2	34.8	36.0	34.6	38.4	35.4	36.8
34.7	33.4	37.4	38.2	31.5	37.7	36.9	34.0
34.4	35.7	37.9	39.3	34.0	36.9	35.1	37.0
33.2	36.1	35.2	35.6	33.0	36.8	33.5	35.0
35.1	35.2	34.4	36.7	36.0	36.0	35.7	35.7
38.3	33.6	39.8	37.0	37.2	34.8	35.7	38.9
37.2	39.3						

(a) Create a relative frequency distribution with the lower-class limit of the first class equal to 31.5 and a class width of 1.
(b) Draw a histogram of the data.
(c) Do you think that the variable "height of 2-year old males" is normally distributed? Why? [20]

QUESTION 7

a. List the methods of collecting data in agriculture. For each method, give the merits and demerits. [5]

b. Given the follwing data

Marks (x)	$0<x\leq5$	$5<x\leq10$	$10<x\leq15$	$15<x\leq20$
Number of students	2	4	3	1

Find

c. the modal class [2]

d. the mean [4]

e. the variance [4]

f. the standard deviation [2]

g. the coefficient of variation [3]

End of Examination Paper