WOMEN'S UNIVERSITY IN AFRICA

Addressing gender disparity and fostering equity in University Education

FACULTY OF AGRICULTURAL SCIENCES

BSc HONOURS IN AGRICULTURE DEGREE

BIOMETRY

HAG 112

JANUARY 2021 MAIN PAPER

Time: 2.00Hrs **Date:**

Instructions

Answer any **three** questions

Question 1

(a) Define the following terms;

(i) Variable (1)
(ii) Biometry (2)
(iii) Replication (2)

(b) The table below shows frequency distribution of seed yield of sorghum obtained from a yield evaluation experiment.

Yield/plot (g)	64.5-84.5	84.5-104.5	104.5-124.5	124.5-144.5
No. of plots	3	5	7	20

Use the information in the above table to calculate;

(i) Average sorghum yield (2)
(ii) Geometric mean yield (3)
(iii) Harmonic mean yield (3)
(iv) Median (4)
(v) Mode (4)

(c) Outline any **four** merits of using the harmonic mean (4)

Question 2

(a). The table below shows frequency distribution of maize grain yield (t ha^{-1}).

Grain yield (t ha^{-1})	2.5-3.5	3.5-4.5	4.5-5.5	5.5-6.5	6.5-7.5
No. of plots	4	6	15	15	10

Use the information in the above table to calculate;

(i) Variance (2)
(ii) Coefficient of variation (C.V) (3)
(iii) Standard deviation (6)

(b) Comment on the calculated C.V in a(ii) (3)

(c) 20 tomatoes in a box of 100 are rotten. If 10 tomatoes are selected at random, find the probability that;

(i) 10 are rotten (2)
(ii) 10 are not rot (2)
(iii) At least one tomato is rotten (4)
(iv) At most 3 are rotten (4)

Question 3

(a). If 2% of the chicken feed manufactured by a certain company is rejected due to poor quality. Find the probability that in a sample of 200 kg,

(i) Less than 2 kg of the feed is rejected (4)

(ii) More than 3 kg of the feed is rejected (4)

(b) Describe the split-split plot design (8)

(c). In a normal distribution whose mean is 2 and standard deviation 3, find the value of the variate such that the probability of the variate from the mean to the value is 0.4115. (9)

Question 4

(a) Explain any **five** roles of statistics in agriculture. (5)

(b). Based on field experiments, a new drought tolerant maize variety is expected to give a yield of 12 t ha^{-1}. The variety was tested on 10 randomly selected farmers' fields. The grain yield (t ha^{-1}) were recorded as; 14.3, 12.6, 13.7, 10.9, 13.7, 12.0, 11.4, 12.0, 12.6, 13.1. Do the results conform to the expectation? (20)

Question 5

Grain yield of smallholder maize produce resulting from use of different foliar and granular insecticides for the control of fall armyworm and stem borer from a complete randomised design (CRD) experiment with 4 replications and 7 treatments are shown in the table below.

Treatment	Grain yield (t ha^{-1})			
Dol-mix (1 kg)	2.54	2.07	2.10	1.80
Dol-mix (2 kg)	3.37	2.59	2.21	2.54
DDT + γ-BHC	2.54	2.46	2.83	2.39
Azodrin	2.39	2.45	1.56	2.12
Dimecron-Boom	2.00	1.68	1.65	1.86
Dimecro-Knap	1.80	1.70	1.90	1.32
Control	1.40	1.52	1.27	1.08

Analyse the effect of the treatments on the obtained maize grain yield. Use $\alpha = 0.05$. (25)

END