(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS

2021/2022 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER

MAIN EXAMINATION

FOR THE DEGREE OF BACHELOR OF SCIENCE IN; AGRICULTURE EDUCATION AND EXTENSION

COURSE CODE: ARE 321

COURSE TITLE: RESEARCH METHODS

DATE: 30TH AUGUST 2022 **TIME: 9 – 11 AM**

INSTRUCTIONS TO CANDIDATES

Answer Question One and Any other TWO (2)

TIME: 2 Hours

This Paper Consists of 3 Printed Pages. Please Turn Over.

KIBU observes ZERO tolerance to examination cheating

QUESTION ONE: (COMPULSORY) **(30 MKS)**

a) Differentiate between
   i. Sample and population. (4 MKS)
   ii. Dependent and Independent Variables (4 MKS)
   iii. Null Hypothesis and Alternative Hypothesis (4 MKS)
b) Outline FIVE characteristics of Hypothesis (5 MKS)
c) Outline FOUR factors to consider when developing a sampling design. (8 MKS)
d) Outline FIVE factors to consider when designing a questionnaire (5 MKS)

QUESTION TWO

a) Outline FIVE steps involved in developing a sampling design. (10 MKS)
b) Outline an Analysis of Variance table for an experiment laid in a Complete Randomized Design. (10 MKS)

QUESTION THREE

a) Outline FOUR merits and FOUR demerits of indirect interviews method of data collection (8 MKS)

b) Describe the following types of research design.

   i. Exploratory Research Design (3 MKS)
   ii. Descriptive Research Design (3 MKS)
   iii. Hypothesis-Testing Research Design (3 MKS)
   iv. Systematic Sampling (3 MKS)

QUESTION FOUR

Five wheat varieties A, B, C, D and E, were tried in an experiment. The layout for each plot, plus the yields obtained in kg is as shown;

B 90	E 80	C 134	A 112	D 92
E 85	D 84	B 70	C 141	A 82
C 110	A 90	D 87	B 84	E 69
A 81	C 125	E 85	D 76	B 72
D 82	B 60	A 94	E 85	C 80

Carry out an analysis of variance to determine if there is any significant difference in performance of the tested varieties. (20 MKS)

QUESTION FIVE

a) Describe FIVE main requirements of a good questionnaire. (10 MKS)
b) List any FIVE dos and FIVE don'ts in report writing. (10 MKS)

$CF = \frac{T^2}{N}$	$CF = \frac{(\sum x)^2}{(rn)}$	$E = \frac{R \times C}{N}$
$CF = \frac{G^2}{rt}$	$MST = \frac{SST}{df(T)}$	$\chi 2 = \frac{\Sigma(O-E)^2}{E}$
$SST = \frac{\sum(T)^2}{(r)} - CF$	$S^2 = \frac{\left(\sum x^2 - \frac{(\sum x)^2}{n}\right)}{(n-1)}$	$\rho = 1 - \frac{6\sum D^2}{N^3 - N}$
$SED = Sp - \{\sqrt{\left[\frac{1}{n1} + \frac{1}{n2}\right]}\}$	$S^2 = \frac{\left(\sum d^2 - \frac{(\sum d)^2)}{n}\right)}{(n-1)}$	$Sxy = n\sum xy - \sum x \sum y$
$Sxx = n\sum x^2 - (\sum x)^2$	$Syy = n\sum y^2 - (\sum y)^2$	$r = \frac{Sxy}{\sqrt{Sxx\ Syy}}$
$S^2 = \frac{\left(\sum d^2 - \frac{(\sum d)^2)}{n}\right)}{(n-1)}$	$t_{critical} = t(_{(n-1)}, {}^{\alpha}/_{2})$	$\chi 2 = \frac{\Sigma(O-E)^2}{E}$
$SED = \frac{S}{\sqrt{n}}$	$Sp = \sqrt{S^2 p}$	$S^2 = \frac{\left(\sum d^2 - \frac{(\sum d)^2)}{n}\right)}{(n-1)}$
$SE = \frac{\sigma}{\sqrt{n}}$	$\%CV = \sqrt{\frac{MS}{\bar{X}}} \times 100\%$	$SED = \sqrt{\frac{2MSE}{r}}$