



(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS

2021/2022 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER

SUPPLEMENTARY/SPECIAL EXAMINATION

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

COURSE CODE: ARE 321

COURSE TITLE: RESEARCH METHODS

DATE: 25TH NOVEMBER 2022

TIME: 11 AM – 1 PM

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 primary and secondary data. (4 MARKS)
- b) Explain the TWO merits and TWO demerits of Questionnaires. (4 MARKS)
- c) Outline any THREE types of research design. (6 MARKS)
- d) List THREE advantages of using Latin Square experimental design. (3 MARKS)
- e) Outline TWO merits and TWO demerits of sampling. (4 MARKS)
- f) List FOUR broad objectives of a research process. (2 MARKS)
- g) List FOUR features a good research report. (4 MARKS)
- h) Explain THREE merits of using Complete Randomized Design. (3 MARKS)

QUESTION TWO

- a) Outline the FOUR steps involved in developing a sampling design. (8 MARKS)
- b) Outline an Analysis of Variance table for an experiment laid in a Randomized Complete Block Design. (6 MARKS)
- c) Describe the features in the experimental linear model below; (6 MARKS)

$$Y_{ij} = \mu + \alpha_i + \epsilon_{ij}$$

QUESTION THREE

- a) Outline THREE merits and THREE demerits of direct interviews. (6 MARKS)
- b) Outline the FOUR main areas in the framework of report writing. (8 MARKS)
- c) Outline THREE criteria for selection of a particular source of data. (6 MARKS)

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	E	C	A	D
90	80	134	112	92
E	D	B	C	A
85	84	70	141	82
C	A	D	B	E
110	90	87	84	69
A	C	E	D	B
81	125	85	76	72
D	B	A	E	C
82	60	94	85	88

- a) Carry out an analysis of variance. (18 MARKS)
- b) What conclusion can you draw from the data given? (2 MARKS)

QUESTION FIVE

- a) Describe FOUR main requirements of a good questionnaire. (8 MARKS)
- b) Describe THREE principles of experimental designs. (6 MARKS)
- c) Describe THREE types of formal Experimental Designs. (6 MARKS)

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