



(Knowledge for Development)

# KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS

2019/2020 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER

SUPPLEMENTARY/SPECIAL EXAMINATION

FOR THE DEGREE OF BACHELOR OF SCIENCE IN; AGRICULTURE  
AND BIOTECHNOLOGY, AGRICULTURE EXTENSION AND  
EDUCATION, AGRICULTURE ECONOMICS, BIOLOGY AND  
BIORESOURCE MANAGEMENT AND CONSERVATION

COURSE CODE: SAB 390/SBL 321

COURSE TITLE: RESEARCH METHODS

DATE: 03/02/2021.

TIME: 2-4 PM.

## INSTRUCTIONS TO CANDIDATES

Answer Question One and Any other **LWC** (2) Questions

TIME: 2 Hours

This Paper Consists of **2 Printed Pages** Please Turn Over. 

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

- a) The following is an ANOVA table from an experimental data analysis from an experiment involving four replicates and six treatments. Complete the table and draw conclusions to the research experimental results. Show your working. (6 Marks)

| SOV       | DF    | SS      | MS    | F <sub>CAL/STAT</sub> |
|-----------|-------|---------|-------|-----------------------|
| Treatment | ----- | -----   | ----- | 4.824                 |
| Error     | ----- | -----   | 0.852 |                       |
| Total     | ----- | 5.21424 |       |                       |

- b) List any FOUR objectives of research. (4 Marks)
- c) Differentiate between unpaired and paired T-tests (4 Marks)
- d) List any FIVE major components of a proposal. (5 Marks)
- e) Outline the following steps in relation to a sampling design development (2 Marks)
- i. Size of a sample (2 Marks)
  - ii. Source list (2 Marks)
  - iii. Sampling unit (2 Marks)
- f) List any FIVE characteristics of a good research hypothesis. (5 Marks)

**QUESTION TWO**

- a. Outline the FIVE Do's and FIVE Don'ts when writing a report. (10 marks)
- b. The following are data on Advertising Expenditure (in Thousands of ksh.) and Sales (in ksh.) in a company.

|                                |    |    |    |    |    |    |
|--------------------------------|----|----|----|----|----|----|
| <b>Advertising Expenditure</b> | 18 | 19 | 20 | 21 | 22 | 23 |
| <b>Sales</b>                   | 17 | 17 | 18 | 19 | 19 | 19 |

Determine the correlation coefficient between them and interpret the result. (10 Marks)

**QUESTION THREE**

- a. Describe the following concepts of a research design. (3 Marks)
- i. Control (3 Marks)
  - ii. Research Hypothesis (3 Marks)
  - iii. Treatments (3 Marks)
  - iv. Experimental units (3 Marks)
- b. The results of 11 students in a Chemistry and Biology examinations are given in the table below. Compute the Coefficient of correlation from the given data. (8 Marks)

| Student | Chemistry | Biology |
|---------|-----------|---------|
| A       | 80        | 82      |
| B       | 45        | 86      |
| C       | 55        | 50      |
| D       | 56        | 48      |
| E       | 58        | 60      |
| F       | 60        | 62      |
| G       | 65        | 64      |

|   |    |    |
|---|----|----|
| H | 68 | 65 |
| I | 20 | 70 |
| J | 75 | 74 |
| K | 85 | 90 |

#### QUESTION FOUR

Mr. Tom intends to do a survey. His objective is to investigate the level of staff motivation among Kibabii university staff. Using the **Multiple-Choice type of Questions**, develop a **TEN QUESTIONS QUESTIONNAIRE** to guide his study. (20 Marks)

#### QUESTION FIVE

In a study, questionnaires were administered to 812 persons out of a total population of 3248 to seek their opinions on BBI report. The number of opinions is as shown below:

| Treatment    | Ladies     | Gentlemen   | Total       |
|--------------|------------|-------------|-------------|
| Against BBI  | 20         | 792         | <b>812</b>  |
| Pro BBI      | 220        | 2216        | <b>2436</b> |
| <b>Total</b> | <b>240</b> | <b>3008</b> | <b>3248</b> |

Using the data, discuss the opinion of Kenyans on the BBI report. (20 Marks)

|                       |                                |                                    |
|-----------------------|--------------------------------|------------------------------------|
| $CF = \frac{T^2}{N}$  | $CF = \frac{(\sum x)^2}{(rn)}$ | $E = \frac{R \times C}{N}$         |
| $CF = \frac{G^2}{rt}$ | $MST = \frac{SST}{df(T)}$      | $\chi^2 = \frac{\sum(O - E)^2}{E}$ |

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|   |   |   |
|---|---|---|
| $SST = \frac{\sum(T)^2}{(r)} - CF$  | $s^2 = \frac{(\sum x^2 - \frac{(\sum x)^2}{n})}{(n - 1)}$   | $\rho = 1 - \frac{6\sum D^2}{N^3 - N}$                    |
| $SED = Sp - \left\{ \sqrt{\left[ \frac{1}{n_1} + \frac{1}{n_2} \right]} \right\}$ | $s^2 = \frac{(\sum d^2 - \frac{(\sum d)^2}{n})}{(n - 1)}$   | $Sxy = n\sum xy - \sum x\sum y$                           |
| $Sxx = n\sum x^2 - (\sum x)^2$  | $Syy = n\sum y^2 - (\sum y)^2$  | $r = \frac{Sxy}{\sqrt{Sxx Syy}}$                          |
| $s^2 = \frac{(\sum d^2 - \frac{(\sum d)^2}{n})}{(n - 1)}$                         | $t_{critical} = t_{(n-1), \alpha/2}$  | $\chi^2 = \frac{\sum(O - E)^2}{E}$                        |
| $SED = \frac{S}{\sqrt{n}}$  | $Sp = \sqrt{S^2 p}$   | $s^2 = \frac{(\sum d^2 - \frac{(\sum d)^2}{n})}{(n - 1)}$ |
| $SE = \frac{\sigma}{\sqrt{n}}$  | $\%CV = \sqrt{\frac{MS}{X}} \times 100\%$   | $SED = \sqrt{\frac{2MSE}{r}}$                             |
|   | $r = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{\{N(\sum X^2) - (\sum X)^2\}} \sqrt{\{N(\sum Y^2) - (\sum Y)^2\}}}$ |   |

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