

LAIKIPIA



UNIVERSITY

# UNIVERSITY EXAMINATIONS

1<sup>ST</sup> SEMESTER 2023/2024 ACADEMIC YEAR

FOURTH YEAR EXAMINATION FOR THE DEGREE  
OF BACHELOR OF SCIENCE IN COMMUNITY  
DEVELOPMENT

**CDEV 416: SOCIAL STATISTICS II**

***STREAM:***

***TIME: 2 HRS***

***DAY: FRIDAY [11.30-13.30 P.M]***

***DATE: 08/12/2023***

**THIS QUESTION PAPER CONSISTS OF SIX (6) PAGES**

**PLEASE DO NOT OPEN UNTIL THE INVIGILATOR SAYS SO.**



## INSTRUCTIONS

- i) *Do Not Write anything on this question paper*
- ii) *Answer Question one (30mks) and any other Two Questions (20mks each)*

### QUESTION ONE

- a) Define the following terms as used in social statistics
- i) Regression (1mks)
  - ii) Variable (3mks)
  - iii) Data (3mks)
- b) A fourth-year student of Laikipia University drew a sample of 760 farmers from Nyahururu Farmers Association, whom she asked to indicate their farming technique preferences:- **Agroforestry Practice, Use All the Land and Combine Livestock & Crops** and whether they approve or disapprove of any major change of the farming technique. She tabulated the frequency data and placed in the appropriate cells as shown in Table 1. The student intends to know whether the proportions of farmers practising **Agroforestry Practices, Use All the Land, or Combine Livestock and Crops** who favour the major change of farming technology differ significantly, indicating a relationship between farming technique preference and attitude towards the major change of the farming technique.

**Table 1 Response to questions with expected values**

FARMING TECHNIQUE PREFERENCE	APPROVE		DISAPPROVE		TOTAL	
	Observed	Expected	Observed	Expected	Observed	Expected
<b>Agroforestry Practices</b>	130		110		240	
<b>Use All the Land</b>	90		100		190	
<b>Combine Livestock and Crops</b>	140		190		330	
<b>Total</b>						

- i) Copy the table and fill in the blank spaces for each cell. Show your working (6mks)
- ii) Use the formula,  $X^2 = \frac{\sum(f_o - f_e)^2}{f_e}$  compute Chi-square ( $X^2$ ) value for the data (4mks)
- iii) State the null and alternative hypotheses the student is likely to use. (1mk)

- iv) Use the attached Chi-square table to test your hypothesis at 5% significance level, and make conclusion for the data **(2mks)**
- c) Fourth year students at Laikipia University, Nyahururu were asked to name their favourite flavour of cakes. The table 2 below presents the information about their responses.

**Table 2:** Students’ distribution according to their favourite flavours

Flavour	Number of students	Percentage	Degrees
Vanilla	36		
Mint	12		
Strawberry	8		
Chocolate	10		
Black forest	28		
Normal	6		
Total	100		

Source: Field data, 2023

- d) Copy, fill table 1 and draw a well-labelled pie-chart to represent the data in Table 1. Show your working clearly **(7mks)**
- e) Suppose the size of population 24 and the researcher wishes to select a samples of 22 Determine the number of samples that are available for use by the researcher can **(3mks)**

**QUESTION TWO**

The data below was collected (in kgs) from patients who visited Nakuru Provincial General Hospital for treatment on a Monday.

53.00 39.00 35.00 40.00 43.60 68.00 66.00 24.00 27.00 21.00 16.00 19.40 20.50  
 45.00 36.00 26.00 32.00 44.00 39.40 50.50 51.00 30.50 60.30 49.00 39.50 65.00  
 69.00 50.20 50.50 24.00 56.00 23.00 18.00 19.50 22.00 20.40 20.60 19.30 17.00  
 50.90 52.00 55.00 60.10 60.30 60.40 60.50 60.90 69.50 69.80 70.00 72.00 49.50  
 50.40 50.50 60.46 29.40 30.43 40.48 56.00 40.37



- i) Prepare a tally table (6mks)
- ii) State the modal class (2mks)
- iii) Find out the mass of the patients (12mks)

**QUESTION THREE**

- a) Define the term level of measurement and explain by use of relevant example, four levels of measurements used in social statistics. (8mks)
- b) There has been a public outcry of degradation of English language in primary schools in the rural areas. In response to public demand, the Government of Kenya is considering the deployment of qualified trained teachers to rural areas. Therefore, the government instituted a fact-finding committee to study the situation, and advice the government accordingly. The committee, in fulfillment of its mission, randomly selected 16 students of sixth grade from different rural schools, and 14 of the same grades from different urban schools. All the 30 selected students were administered the same test in English Language.

The scores of the students from both types of schools are recorded in the table 3 below.

**Table 3 Scores of English Language Test of the two schools**

Students No.	Rural school score	Urban schools score
1.	77	87
2.	68	83
3.	64	70
4.	54	95
5.	85	86
6.	81	55
7.	80	94
8.	56	92
9.	71	60
10.	48	72
11.	73	74
12.	78	58
13.	76	75
14.	88	96
15.	90	-
16.	69	-



- c) Use Mann Whitney U test statistic to make conclusion whether there is significant difference in the data . . . . . (12mks)

**QUESTION FOUR**

a) There has been a strong dispute that students who perform well in Kenya Certificate of Primary Education (KCPE) in Makueni County perform poorly in the Kenya Certificate of Secondary Education (KCSE), if they are admitted to high schools in the County. Parents have therefore been wary in high school principals who select the best students to the County schools. The principles on the other hand have been adamant that they cannot select second rate students to their schools. To alleviate the crisis, you, as the County Education Officer (CEO) wishes to establish the truth behind this problem. You thus select the 11 best students in the KCPE in the County, admitted to the local school and compared their ranks - i.e., the KCPE ranks with the KCSE ranks in the County and collect the data shown in Table 4 below

**Table 4: KCPE ranks with the KCSE**

Student	KCPE Rank	KCSE Rank
1	7	9
2	1	6
3	3	1
4	10	3
5	4	2
6	6	10
7	11	7
8	5	8
9	8	5
10	2	4
11	7	11
$\Sigma$		

- i) Copy and complete the above table (Table 3) for the values of d and d<sup>2</sup>. (6mks)
- ii) Given  $\rho_s = 1 - \frac{6 \sum d^2}{n(n^2 - 1)}$ , compute Spearman Rank Correlation coefficient for the collected data (4mks)
- iii) Based on the Spearman Rank Correlation coefficient value, what conclusion as the County Education Officer (CEO) do you draw? (4mks)
- b) Explain by the use of a table, how coefficient of correlation is interpreted. (6mks)



**QUESTION FIVE**

- a) Differentiate between parametric and non-parametric measures **(8mks)**
- b) Outline the advantages and disadvantages of cluster random sampling **(12mks)**

**QUESTION SIX**

You are given the ages of selected inmates in a certain prison in Kenya as 23, 39, 28, 78, 28, 32, 41, 32, 40, 36, 32, 67, 24, 45, 47, 55, 56, 61, 28 and 32 years. As the investigative officer in charge, you wish to establish some characteristic of the inmates. By showing your working, determine the following characteristics and comment on each.

- i) Mode **(2mks)**
- ii) Median **(3mks)**
- iii) Mean **(3mks)**
- iv) Variance **(4mks)**
- v) Standard Deviation **(2mks)**
- vi) Range **(3mks)**
- vii) Coefficient of Variation **(3mks)**

.....**END**.....

