



MACHAKOS UNIVERSITY

University Examinations 2022/2023 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS AND STATISTICS

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (COMMUNITY RESOURCE MANAGEMENT)

BACHELOR OF ENVIRONMENTAL (COMMUNITY DEVELOPMENT)

ESU 200-INTRODUCTION TO STATISTICS.

DATE: 14/4/2023

TIME: 8:30 – 10:30 AM

INSTRUCTION: Attempt question ONE and any other TWO questions

QUESTION ONE (30 MARKS)

- (a) Explain the meaning of the following terms as applied in Statistics
- (i) Population
 - (ii) Sample
 - (iii) Data (6 marks)
- (b) Differentiate between each of the following terms:
- i) Nominal and Ordinal measurement
 - (ii) Primary and secondary data (4 marks)
- (c) The ages of 5 students were recorded as 26,29,24,23 and 28. The mean is 26 years. It was however noted that an error occurred in one of the students' age recorded as 23 years instead of 28 years. Determine the correct mean age of the 5 students after the error was corrected. (3 marks)
- (d) The table below shows marks scored by students in a statistics examination

Class	40-44	45-49	50-54	55-59	60-64
Frequency	6	10	25	11	2

Calculate the mean and standard deviation (7 marks)

- (e) A college collects the following set of data on the number of credits C that a randomly selected group of students carry and the number of hours H that they work during the week

H	20	25	30	50	20	23
C	3.4	3.0	2.8	2.4	2.9	2.9

Determine the rank correlation coefficient based on these data (6 marks)

- (f) A set of cards, identical in size and shape, is numbered 1 to 15 inclusive. A card is drawn at random from the pack and its number n is noted

A is the event: n is prime

B is the event: $n \leq 10$

Calculate (i) $P(A)$, (ii) $P(B)$, (iii) $P(A \cap B)$ (4 marks)

QUESTION TWO (20 MARKS)

The following are the speeds, in miles per, of a group of cars on a high-way as measured with radar gun

58,62,59,53,61,55,57,54,59,53,66,60,58,60,61,58,56,60,58,62,57,55,53,55,61,57,52,58,49,54,52,55,57,60,64,67.

- (i) Construct a frequency distribution table with class interval by 45-49,...etc (6 marks)

- (ii) use the table in (a) above to calculate

the mode (3 marks)

the median (3 marks)

the quartile deviation (8 marks)

QUESTION THREE (20 MARKS)

- (a) State and explain the FOUR methods of collecting data (8 marks)
- b) A small company is interested in analyzing the effects of advertising on its sales Over a five week period as shown below:

Money spend on advertising	5	8	10	15	22
Total sales	6	15	20	30	39

Use the data to determine correlation coefficient between the money spend on adverting and total sales (12 marks)

QUESTION FOUR (20 MARKS)

- a) State and explain the FOUR measurement scales for statistical data. (8 marks)
- b) A study is conducted to determine the relationship between a student's height and shoe size. The following set of data pairs is obtained
(66,9), (63,7), (67,8.5), (71,10), (62,6), (65,8.5), (72,12), (68,10.5), (60,5.5), (66,8).
- (i) Determine the equation of the regression line relating height to shoe based on this sample. (10 marks)
- (ii) Use the equation on (i) above to predict the most likely shoe size for a person who is 70 inches tall (2 marks)

QUESTION FIVE (20 MARKS)

- a) Explain the meaning of the following sampling techniques: -
- (i) Simple Random sampling
 - (ii) Stratified sampling
 - (iii) Multistage sampling
 - (iv) Cluster sampling
 - (v) Quota Sampling
- (10 marks)

- b) The following frequency distribution the lower quartile is 44.5. Determine the values of a and b

Class	Frequency
30-34	7
35-39	12
40-44	a
45-49	b
50-54	38
55-59	15
60-64	8
	$\Sigma f = 200$

(10 marks)