



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

**SCHOOL OF BIOLOGICAL PHYSICAL MATHEMATICS AND ACTUARIAL
SCIENCE**

UNIVERSITY EXAMINATION FOR DEGREE OF BACHELOR OF SCIENCE

ACTUARIAL, B.ed SCIENCE, B.ed ARTS, B.ed SPECIAL NEEDS

1ST YEAR 1ST SEMESTER 2023/2024 ACADEMIC YEAR

REGULAR (MAIN)

COURSE CODE: WAB 2107

COURSE TITLE: DESCRIPTIVE STATISTICS

EXAM VENUE:

**STREAM: (B.s.c ACTUARIAL SCIENCE, B.ed
SCIENCE, B.ed ARTS, B.ed SPECIAL NEEDS)**

DATE:

EXAM SESSION:

TIME: 2.00 HOURS

Instructions:

- 1. Answer question 1 (Compulsory) and ANY other 2 questions**
- 2. Candidates are advised not to write on the question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

QUESTION ONE (30 MARKS)

a) Outline FOUR uses of statistics . (4 Marks)

b) The speeds, to the nearest mile per hour of 120 vehicles passing a check point were recorded and are grouped in the table below

Speed in km/hour	21 – 25	26 - 30	31 - 35	36 - 45	46 - 60
Number of vehicles	22	48	25	16	9

Estimate the mean speed of the vehicles (3 Marks)

c) Cartons of orange juice are advertised as containing one liter. A random sample of 100 cartons gave the following results for the volume of x .

$$\sum x = 101.4 \quad \sum x^2 = 102.83$$

Calculate the mean and standard deviation of the volume of orange juice in 100 cartons. (3 Marks)

d) 31 students tried to estimate the length of a line. The line was actually 60 mm long. These are their results in millimeters

61	70	46	44	26	23	30	83	52	44	38
37	49	59	58	63	31	29	37	48	76	61
46	31	38	41	49	52	56	75	61		

i. Find the median and the other quartiles of this distribution and use the quartiles to estimate skewness. (6 Marks)

ii. Draw a histogram with equal intervals $20 \leq l < 30$; $30 \leq l < 40$;(3 Marks)

e) An analysis of daily wages paid to workers in two factories A and B belonging to the same industry give the following information.

Factory	A	B
No. of workers	600	700
Average daily wages	286	275
Variance of distribution	81	100

i. Which factory is more consistent in wages. (3 Marks)

ii. Find the average monthly wages of the workers in the two firms taken together. (2 Marks)

iii. Find the combined variance of the two factories. (3 Marks)

f) Outline THREE shortcomings of index numbers. (3 Marks)

QUESTION TWO (20 MARKS)

a) The first four moments of a distribution about the value 4 of the variable are -1.5, 17, -30 and 108. Find the moment about mean. (6 Marks)

- b) Use the data below to calculate:
- Quartile deviation
 - Median
 - Arithmetic mean (Take $A = 45$)
 - Standard deviation
 - Coefficient of variation

Class	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
Frequency	5	20	12	10	8	5

(14 Marks)

QUESTION THREE (20 MARKS)

- a) Calculate the first four moments of the following distribution about the mean

x	0	1	2	3	4	5	6	7	8
f	1	8	18	46	70	46	18	8	1

(15 Marks)

- b) Obtain the coefficient of skewness and comment on the results. (2 Marks)
 c) Find the measure of kurtosis and comment on your results (3 Marks)

QUESTION FOUR (20 MARKS)

- a) Outline TWO uses of index numbers. (2 Marks)
 b) Determine the Fisher price index for Year 0, Year 1 and Year 2 using year 0 as the base year from the table below. (18 Marks)

	Year 0		Year 1		Year 2	
	Price	Quantity	Price	Quantity	Price	Quantity
Item A	2	15	2.25	20	2.35	23
Item B	1	20	1.10	20	1.14	25
Item C	1.5	25	2.10	17	2.40	14

QUESTION FIVE (20 MARKS)

- a) Find the Pearson's correlation coefficient for the following data.

x	1	3	4	6	8	9	11	14
f	1	2	4	4	5	7	8	9

(10 Marks)

- b) In a partially destroyed laboratory, records of analysis of correlated dated had the following results that are found to be legible

Variance of $x = 9$

Regression equation $8x - 10y + 66 = 0$

$40x - 18y = 214$

Find

- i. the mean of x and y (3 Marks)
 ii. the correlation coefficient between x and y (4 Marks)

iii. the standard deviation of y

(3 Marks)