

**KISII UNIVERSITY  
UNIVERSITY EXAMINATIONS**

**MAIN CAMPUS**

**SECOND YEAR EXAMINATION FOR THE AWARD OF THE DEGREE OF  
BACHELOR OF ECONOMICS AND STATISTICS**

**FIRST SEMESTER 2023/2024**

**[DECEMBER , 2023]**

**BECS 232: ECONOMIC STATISTICS I**

**STREAM: ECON Y2S1**

**TIME: 2 HOURS**

**DAY:.....**

**DATE.....**

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**INSTRUCTIONS**

1. Don't write anything on this question paper.
2. Answer questions ONE and any other TWO questions.
3. Question one carries 30 marks and other question carry 20 marks each.

**QUESTION ONE (COMPULSORY 30 MARKS)**

(a) Define the following terms.

- (i) Arithmetic mean.
- (ii) Geometric mean.
- (iii) Harmonic mean.
- (iv) Median and
- (v) Mode

(5 marks)

(b) The daily wages of 100 employees in a factory are given below:

Wage in Ksh	60 – 62	63 – 65	66 – 68	69 – 71	72 - 74
No of employees	5	18	42	27	8

Calculate

(i) The mean wage per day.

(ii) The standard deviation. (10 marks)

(c) i. Give two advantages of taking a sample.

ii. Give four characteristics of a good sample in sampling. (6 marks)

(d) Write short notes on the following

i. Student t distribution

ii. The chi-square distribution

iii. The F distribution (9 marks)

### QUESTION TWO ( 20 MARKS)

(a) A sample of 200 people with a particular disease was selected. Out of these 100 were given a drug and the others were not given any drug. The results are as shown.

Outcome of drugs	Number of persons		Total
	Drug	no drug	
Cured	65	55	120
Not cured	35	45	80
Total	100	100	200

Test whether the drug is effective or not.

(10 marks)

- (b) The average chlorine concentration recovered from a sample of chlorine measurements in 36 different locations in river Gucha is found to be 2.6 mg per litre. Find the 95% and 99% confidence intervals for the mean chlorine concentration  $\mu$ . Assume that the population standard deviation is 0.3. Comment on your results. (10 marks)

**QUESTION TREE ( 20 MARKS)**

Use the following production data to answer the questions given below.

Out – turn ( in tons)	Number of days
25 – 30	6
30 – 35	5
35 – 40	10
40 – 45	20
45 – 50	10
50 – 55	5

- ( i) What is the mean out- turn?
- (ii) Calculate the mode , median,  $Q_1$  and  $Q_2$ .
- (iii) Draw the cumulative frequency curve. ( 20 marks)

**QUESTION FOUR ( 20 MARKS)**

- (a)A manufacturer of vitamin c complex tablets wants to check the quality of his product. He has estimated the mean content  $\mu$  of a batch as 100 units and a standard deviation as 10 units. For a new batch, if he tests 25 tablets, what will be the distribution of the sample mean.
- (b) A machine produces the following units per hour. The data is randomly collected for 10 hours. The production is 63, 64, 69, 71, 70, 69, 63, 70, 65 and 66 units per hour. Calculate the value of  $t$ .

(c) The following distribution shows the cumulative frequencies of 228 observation with missing frequencies  $f_1$ ,  $f_2$ , and  $f_3$ . If the mode and median are 37 and 38 respectively. Calculate the missing frequencies.

Class	Cumulative frequencies
0-10	4
10-20	20
20-30	$20 + f_1$
30-40	$20 + f_1 + f_2$
40-50	$20 + f_1 + f_2 + f_3$
50-60	$43 + f_1 + f_2 + f_3$
60-70	$48 + f_1 + f_2 + f_3$

(20 marks)