



# MACHAKOS UNIVERSITY

University Examinations for 2022/2023 Academic Year

SCHOOL OF BUSINESS, ECONOMICS AND HOSPITALITY AND TOURISM

MANAGEMENT

DEPARTMENT OF ECONOMICS

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF ECONOMICS AND FINANCE

BACHELOR OF ECONOMICS AND STATISTICS

BACHELOR OF ECONOMICS

EES 201: STATISTICS FOR ECONOMISTS I

DATE:

TIME:

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## INSTRUCTIONS

Answer Question ONE and ANY Other TWO Questions.

### QUESTION ONE (compulsory) (30 MARKS)

- a) Distinguish between the following terms using relevant illustrations:
- i. Components and multiple bar charts. (2 marks)
  - ii. Frequency and Probability tables. (2 marks)
  - iii. Geometric and arithmetic mean (2 marks)
  - iv. Binomial and Poisson distribution. (2 marks)
  - v. Coefficient of variation and variance (2 marks)
- b) The price – earnings ratio for 30 different stocks on the New York stock exchange are as shown here.

4.8	5.2	7.6	5.7	6.2	6.6	7.5	8.0	9.0	7.7
3.7	7.3	6.7	7.7	8.2	9.2.	8.3	7.3	8.2	6.5
5.4	9.3	10.0	7.3	8.2	9.7	8.4	4.7	7.4	8.3

*Required*

- i. According to Chebshev's Theorem, at least how many price – earnings ratios lies within two standard deviations of the mean? (3 marks)
- ii. How many actually do lie within two standard deviations of the mean? (3 marks)

c) The following table shows the weekly earnings of workers in two similar companies.

Weekly earnings	Number of workers	
	Company A ( $f_A$ )	Company B ( $f_B$ )
400-600	5	15
600-800	7	30
800-1000	7	28
1000-1200	18	14
1200-1400	23	7
1400-1600	14	3
1600-1800	10	2
1800-2000	16	1

Calculate:

- i. The mean (3 marks)
- ii. The standard deviation (5 marks)
- iii. The Coefficient of variation (4 marks)
- iv. Comment on the Variability of the two distributions. (2 marks)

### QUESTION TWO (20 MARKS)

- a) Discuss the reasons why a researcher may decide to collect data from the sample and not the whole population. (8 marks)
- b) The observations listed are times (in minutes) that 30 students took to complete their first statistics test.

42.3	70.0	37.2	69.2	41.9	39.2	67.7	52.6	63.2	39.2
58.9	45.5	53.3	61.9	45.7	42.7	69.1	55.5	63.9	41.7
38.9	52.4	68.3	61.2	70.1	39.2	68.3	52.5	64.9	69.8

Required:

- i. Simplify the data in form of frequency table (7 classes). (6 marks)
- ii. Construct more than cumulative frequency curve and estimate 50th percentile. (6 marks)

**QUESTION THREE (20 MARKS)**

- a) What is a Lorenz Curve? Discuss any FIVE properties of a Lorenz Curve (9 marks)
- b) Given the data in the table below, find the mean deviation of the grouped data. (5 marks)

Classes (marks)	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency (No. of students)	2	4	4	8	6	3	2

If  $X$  is a normal random variable with mean 82 and variance 25, find a,

- i.  $P(75 \leq X \leq 84)$  (3 marks)
- ii.  $P(76 \leq X \leq 86)$  (3 marks)

**QUESTION FOUR (20 MARKS)**

- a) The following data shows the weekly income of certain employees in a farm.

Weekly income	80-100	100-120	120-140	140-160	160-180	180-200	200-250	250-300	300-350	350-400	400-500
Frequency (million)	0.2	0.4	0.5	0.6	0.7	0.7	1.2	0.6	0.3	0.1	0.1

Find:

- i) The inter quartile range (2 marks)
- ii) The quartile deviation (2 marks)
- iii) lower and upper quartiles (2 marks)
- iv) The 33<sup>rd</sup> and the 63<sup>rd</sup> percentiles (2 marks)
- v) The 3<sup>rd</sup> and the 7<sup>th</sup> deciles (2 marks)
- (Show your workings).
- b) By giving necessary illustrations, briefly explain the stages to statistical investigation. (10 marks)

**QUESTION FIVE (20 MARKS)**

- a) What is the expected value of the experiment of rolling a die? (2 marks)
- b) Distinguish between continuous and discrete distributions. (3 marks)

c) The following table gives the distribution of scores obtained by a previous class of Statistics.

Scores	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
Cumulative	20	50	90	140	172	188	196	200

Required:

- i. How many students were in the Statistics class (2 marks)
- ii. Using the same axis, draw a histogram and a frequency polygon for the distribution.

(8 marks)

d) Given the following data, calculate the geometric mean and the harmonic mean. (5 marks)

<b>X</b>	<b>Log x</b>	<b>1/x</b>
180.7	2.256	0.00553403
214.7	2.3318	0.00465766
121.5	2.08457	0.00823045
131	2.11727	0.00763359
125.8	2.09968	0.00794913
113.6	2.05538	0.00880282