



UNIVERSITY EXAMINATIONS
SECOND YEAR EXAMINATION FOR THE AWARD OF DEGREE OF
BACHELOR OF EDUCATION SCIENCE/ARTS, BACHELOR OF SCIENCE
MATHEMATICS AND STATISTICS
SECOND SEMESTER 2022/2023
[JUNE - SEPTEMBER, 2022]

MATH 141: INTRODUCTORY STATISTICS

STREAM: Y2 S2

TIME: 2 HOURS

DAY: THURSDAY, 9.00 AM – 11.00 AM

DATE: 15/09/2022

INSTRUCTIONS:

- 1. Do not write anything on this question paper.**
- 2. Answer ALL Questions in section A [Compulsory] and any other THREE Questions in section B.**

SECTION A [31Marks]

QUESTION ONE

a) Define the following terms [5 marks]

- i. Statistics
- ii. Probability
- iii. Measure of central tendency
- iv. Skewness
- v. Kurtosis

b) Explain the usefulness of line graph over diagrams in data presentations [3marks]

c) List any four properties of a good average [4marks]

d) State any three properties of the arithmetic mean [3marks]

QUESTION TWO [16 Marks]

a) The average weight of the following distribution is 58.5kg. Find the value of x . [3marks]

Weight (kg)	50	55	60	$x+12.5$	70	Total
No. of men	1	4	2	2	1	10

b) The following contents of data were recorded from each of the 30 packets of washers considered under a study: 28, 31, 29, 27, 30, 29, 29, 26, 30, 28, 28, 29, 27, 26, 32, 28, 32, 31, 25, 30, 27, 30, 29, 30, 28, 29, 31, 27, 28, and 28. Construct the frequency distribution table and obtain Mean and Mode [5 marks]

c) The table below gives the marks obtained in statistics by 60 students.

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	5	8	11	15	13	6	2

Draw a cumulative frequency curve (Ogive) and determine the median mark and the sixth decile marks (D_6). [4marks]

d) State any four principles of graph construction [4marks]

SECTION B [39 Marks]

QUESTION THREE [13 Marks]

a) Define the following terms as used in probability

i. An event [2marks]

ii. mutually exclusive [2marks]

b) Explain any two laws used in probability [4marks]

c) The probability that a contractor will get a plumbing contract is $\frac{2}{3}$ and the probability that he will not get an electric contract is $\frac{5}{9}$. If the probability of getting at least one contract is $\frac{4}{5}$, what's is the probability that he will get both? [5marks]

QUESTION FOUR [13 Marks]

Use the following data to find

- a) Arithmetic mean [3marks]
 b) Mode [5marks]
 c) Standard deviation [5marks]

50-59	60-69	70-79	80-89	90-99	100-109	110-119
7	81	192	312	218	82	18

QUESTION FIVE [13 Marks]

Given the data below, find;

- a) Karl person's coefficient of skewness [5marks]
 b) Bowley's coefficient of skewness [4marks]
 c) Kelly's coefficient of skewness [4marks]

class	0-10	10-20	20-30	30-40	40-50
frequency	5	10	15	8	7

QUESTION SIX [13 Marks]

- a) Define moments and state their use in analysis [3marks]
 b) From the following data, calculate the first, second, third and fourth moments about an arbitrary point [10marks]

C-I	2.5-7.5	7.5-12.5	12.5-17.5	17.5-22.5	22.5-27.5	27.5-32.5	32.5-37.5
F	5	10	20	35	15	10	2

QUESTION SEVEN [13 Marks]

Given the expression below,

$$u_1 = 0$$

$$u_2 = u_2 - (u_1)^2$$

$$u_3 = u_3 - 3(u_1 u_2) + 2(u_1)^3$$

$$u_3 = u_4 - 4(u_1 u_3) + 3(u_1)^4$$

Use the data below to obtain the moments about the actual mean

[13marks]

C-I	5.5- 11.5	11.5-16.5	16.5-21.5	21.5-26.5	26.5-31.5	31.5-36.5	36.5-41.5
F	4	6	10	15	8	4	3