(Knowledge for Development)

# KIBABII UNIVERSITY

**(KIBU)**

## UNIVERSITY EXAMINATIONS
## 2022/2023 ACADEMIC YEAR

## END OF SEMESTER EXAMINATIONS
## SECOND YEAR FIRST SEMESTER EXAMINATIONS

## FOR THE DIPLOMA IN
## (INFORMATION TECHNOLOGY)

**COURSE CODE:** DIT 072

**COURSE TITLE:** INTRODUCTION TO PROBABILITY AND STATISTICS

**DATE:** 15/12/2022 **TIME:** 9.00 A.M – 11.00 A.M

**INSTRUCTIONS TO CANDIDATES**

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

## QUESTION ONE [COMPULSORY] (24 MARKS)

**a)** Define the following terms

**i)** Probability (2mks)

**ii)** Statistics (2mks)

**iii)** Secondary data (2mks)

**b)** Name two sources of data and explain their sources. (4mks)

**c)** Construct frequency distribution table for the following marks obtained by 50 students 57, 67, 46, 30, 44, 56, 43, 54, 65, 57, 41, 50, 48, 51, 62, 59, 58, 55, 48, 47, 34, 27, 60, 52, 65, 36, 68, 72, 54, 51, 23, 50, 38, 42, 63, 75, 12, 33, 26, 39, 35, 47, 43, 52, 52, 59, 64, 77, 15, 21 (5mks)

**d)** Given the following data 3, 4, 5, 6 and 7, find the variance (3mks)

**e)** When tossing a coin, find the probability of a tail assuming that the coin is unbiased (2mks)

**f)** Calculate the arithmetic mean, mode and median of the following (4mks)

| x | 1 | 3 | 2 | 4 |
|---|---|---|---|---|
| f | 5 | 2 | 4 | 1 |

## QUESTION TWO (18 MARKS)

**a)** Define the following terms as used in probability (4mks)

i) Range

ii) Mutually exclusive events

**b)** When a coin is tossed, the probability of getting a head (H) is $\frac{1}{3}$. if the coin is tossed two times find the probability of getting two tails using a tree diagram for illustration (5mks)

**c)** A couple has two children. What is the probability that both are boys given that at least one is a boy (4mks)

**d)** Outline the three axioms of probability (3mks)

**e)** When rolling a six sided die what is the probability of having even numbers (2mks)

## QUESTION THREE (18 MARKS)

a) Given the following data find the variance (6mks)

| x | 10 | 15 | 16 | 20 | 17 | 14 | 10 | 16 |
|---|---|---|---|---|---|---|---|---|
| f | 3 | 6 | 7 | 11 | 9 | 5 | 4 | 2 |

b) The following are the weights of 40 male students at Kibabii University. Construct a frequency histogram (6mks)
138, 164, 150, 132, 144, 125, 149, 157, 146, 158, 140, 147, 136, 148, 152, 144, 168, 126, 138, 176, 163, 119, 154, 165, 146, 173, 142, 147, 135, 153, 140, 135, 161, 145, 135, 142, 150, 156, 145, 128

c) The table below shows the IQs of 480 school children at a certain elementary school. Find the standard deviation (6mks)

| x | 70 | 74 | 78 | 82 | 86 | 90 | 94 | 98 | 102 | 106 | 110 | 114 | 118 | 122 | 126 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| f | 4 | 9 | 16 | 28 | 45 | 66 | 85 | 72 | 54 | 38 | 27 | 18 | 11 | 5 | 2 |

## QUESTION FOUR (18 MARKS)

**a)** Define the following terms (3mks)

**i)** Regression

**ii)** Correlation

**b)** Using the data provided, draw a scatter diagram and hence draw the line of best feat (6mks)

| **Expenditure** | 25 | 30 | 15 | 75 | 40 | 65 | 24 | 35 | 70 |
|---|---|---|---|---|---|---|---|---|---|
| **Defective parts** | 50 | 35 | 60 | 15 | 46 | 20 | 45 | 42 | 22 |

**c)** The following are scores of students in two subjects ie Maths and Physics: (6mks)

| **Maths** | 2 | 7 | 6 | 1 | 4 | 3 | 5 | 8 |
|---|---|---|---|---|---|---|---|---|
| **Physics** | 3 | 6 | 4 | 2 | 5 | 1 | 8 | 7 |

Calculate the Pearson correlation coefficient

**d)** Name three stages that is involved in undertaking statistics (3mks)

## QUESTION FIVE (18 MARKS)

**a)** Find the standard deviation of the following grouped data (10mks)

| Class | Frequency |
|---|---|
| 10 - 20 | 5 |
| 20 - 30 | 4 |
| 30 – 40 | 8 |
| 40 - 50 | 13 |
| 50 - 60 | 12 |
| 60 - 70 | 9 |
| 70 - 80 | 7 |
| 80 - 90 | 3 |

**b)** The following table shows the pattern of inspection and defective parts delivered to customers. Find how strong is the relation between inspection in expenditure and defective parts and what extent they may predict the defective part deliveries from the knowledge of expenditure inspection (8mks)

| Expenditure | Defective parts |
|---|---|
| 25 | 50 |
| 30 | 35 |
| 15 | 60 |
| 75 | 15 |
| 40 | 46 |

| | |
|---|---|
| 65 | 20 |
| 24 | 45 |
| 35 | 42 |
| 70 | 22 |