

**W1-2-60-1-6**

**JOMO KENYATTA UNIVERSITY**

**OF**

**AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2015/2016**

**SECOND YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY**

**SMA 2103:/STA 2100: PROBABILITY AND STATISTICS I**

**DATE: APRIL, 2016 TIME: 2 HOURS**

**INSTRUCTIONS: QUESTION ONE AND ANY OTHER TWO QUESTIONS**

**QUESTION ONE**

1. Distinguish between the following concepts in statistics giving

an example in each case:

1. Mutually exclusive and independent [2 marks]
2. Discrete and continuous variable [2 marks]
3. Population and sample [2 marks]
4. Two boys John and Mike are firing at the target. The probability

of John hitting the bull (centre of target) is 1/5 and his probability

of hitting anywhere else on the target (outer) is 2/5. The corresponding probability for Mike are 1/8 and ¼ .

Find the probability that if each fires at the same time only

one will hit on the target. [4 marks]

1. Given the following discrete data 12, 7, 6, 3, 15, 10, 18, 15.

Find:

1. Mean [2 marks]
2. Median [2 marks]
3. Standard deviation [2 marks]
4. A certain data set was collected on a random variable x and the

following summaries made:

 and 

Find the mean and standard deviation of the data set. [4 marks]

1. At a goods deport, the masses of 50 items of luggage were

recorded correct to the nearest 0.1 kg as shown below:

10.6 21.9 22.9 28.7 26.9 16.1 14.6 30.2 29.7 33.8

20.9 15.6 23.5 24.1 16.9 14.4 17.8 34.1 32.2 29.1

28.2 27.2 31.2 18.2 13.2 19.4 22.9 23.1 24.2 25.9

22.5 28.4 11.7 23.2 17.2 23.9 26.3 19.3 27.8 33.4

18.4 21.7 22.9 12.9 23.5 17.1 29.2 16.3 25.9 32.7

1. Make a frequency distribution table by using a class

interval of 5 kg [3 marks]

1. Represent the data on a Histogram [3 marks]
2. For a random variable y, the distribution function f(x) is given

below where x  (0, 1, 2, 3, 4)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x | 0 | 1 | 2 | 3 | 4 |
| f(x) | 0.2 | 0.3 | 0.75 | 0.95 | 0.1 |

Determine:

1. The expected value of x [2 marks]
2. Variance of x [3 marks]

**QUESTION TWO**

1. Find the least square lines y on x and x on y to the following

data [10 marks]

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| x | 1 | 3 | 4 | 6 | 8 | 9 | 11 | 14 |
| y | 1 | 2 | 4 | 4 | 5 | 7 | 8 | 9 |

1. The following table gives the marks obtained by some students

in a statistical examination paper.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Marks x | 20 - 29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | 80-89 | 90-99 |
| No. of students, f | 3 | 8 | 15 | 20 | 25 | 17 | 9 | 5 |

By calculation, find:

1. Inter quartile range
2. Quartile deviation
3. 78th percentile

[10 marks]

**QUESTION THREE**

1. The table below shows marks scored by a student in mathematics

and chemistry quizzes marked out of 10.

|  |  |
| --- | --- |
| Math, x | English, y |
| 1 | 1 |
| 3 | 5 |
| 5 | 3 |
| 7 | 9 |
| 9 | 7 |

Compute the Pearson correlation coefficient [8 marks]

1. The table below shows how 10 students arranged in alphabetical

order were ranked according to achievements, in both practical

and theory examinations of an IT course.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Practical | 8 | 3 | 9 | 2 | 7 | 10 | 4 | 6 | 1 | 5 |
| Theory | 9 | 5 | 10 | 1 | 8 | 7 | 3 | 4 | 2 | 6 |

Find the coefficient of rank correlation and comment

on the result. [10 marks]

1. Distinguish between shewness and kurtosis. [2 marks]

**QUESTION FOUR**

1. 100 leaves were collected from the garden and their lengths

recorded to the nearest millimeter grouped as shown in the

table below:

|  |  |
| --- | --- |
| Length (mm) | Frequency (f) |
| 60 - 64 | 2 |
| 65 - 69 | 8 |
| 70 - 74 | 17 |
| 75 - 79 | 26 |
| 80 - 84 | 24 |
| 85 - 89 | 16 |
| 90 - 94 | 6 |
| 95 - 99 | 1 |

1. Draw an ogive curve. [5 marks]
2. Estimate the median and quartiles graphically [5 marks]
3. Calculate the mean, mode and median of the data [6 marks]
4. Given the following set of numbers (2, 3, 7, 8, 10).

Find the second, third and fourth moment about the mean. [4 marks]