

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

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2015/2016**

**YEAR II SEMESTER I EXAMINATION FOR THE DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY/MATHEMATICS AND COMPUTER SCIENCE**

**STA 2100/SMA 2103: PROBABILITY AND STATISICS**

**DATE:DECEMBER 2015 TIME: 2 HOURS**

**INSRUCTIONS:** Answer question one and any other two questions.

QUESTION ONE (30 MARKS) COMPULSORY

Explain briefly the meaning of the following

i. Mutually exclusive events.

ii. Classical probability

iii. Personalistic approach to probability.

iv. Correlation analysis. (4 marks)

b. Give four reasons why you think statisticians prefer to use a sample instead of the while population. (4 marks)

c. A set of 20 observations has a mean of 40 and variance of 18. Another set of 25 observations has a mean of 35 and variance of 16. Find the mean and the standard deviation of the combined set of 45 observations. (4 marks)

d. A fair coin is tossed three times. Find the probability distribution of the number of heads, expected number of heads and variance. (4 marks)

e. Find the quartiles of the following distribution. (4 marks)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Class | 0-9 | 10-19 | 20-29 | 30-39 | 40-49 |
| frequency | 12 | 14 | 24 | 12 | 8 |

f. The probability of Brendah passing an interview if the interviewer is a stranger is 0.74 and it is 0.89 if the interviewer is known to her. In , this company, 30% of the interviews are strangers to Brendah. Find the probability that,

 i. Brendah fails the interview (3 marks)

 ii. Given that she failed the interview, find the probability that the interview was a stranger. (4 marks)

g. For a random variable x, the distribution function is give below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| X | 0 | 1 | 2 | 3 | 40.2 |
| F(x) | 0.2 | 0.3 | 0.75 | 0.95 | 0.1 |

 Determine the variance of x. (3 marks)

QUESTION TWO (20 MARKS)

a. Find the mean, mode and median of the following grouped frequency distribution.

 (10 marks)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Class | 3-7 | 8-12 | 13-17 | 18-22 | 23-27 | 28- |
| frequency | 15 | 13 | 27 | 29 | 10 | 13 |

b. Given the following data

 i. Draw an ogive curve. (5 marks)

 ii. locate the median and quartliles from the ogive curve. (5 marks)

QUESTION THRE (20 MARKS)

a. From the data given below, find

 i. The two regressions equations. (8 marks)

 ii. The most likely marks in mathematics when marks in economies is 30.

 (2 marks)

 iii. The coefficient of correlation between marks in mathematics and economics.

 (10 marks)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Score in accounting (x) | 25 | 28 | 55 | 56 | 58 | 60 | 65 | 68 | 70 | 75 | 85 |
| Score in mathematics (y) | 43 | 54 | 50 | 48 | 60 | 62 | 64 | 65 | 70 | 74 | 70 |

QUESTION FOUR (20 MARKS)

a. Recent unit price of various commodities in Nakuru and Kisii were as follows:

|  |  |  |
| --- | --- | --- |
| Commodity | Nakuru (in ksh 100) | Kisii (in shs 100) |
| A | 8 | 9 |
| B | 12 | 25 |
| C | 19 | 23 |
| D | 15 | 11 |
| E | 7 | 9 |
| F | 6 | 11 |
| G | 8 | 13 |
| H | 6 | 6 |
| I | 13 | 7 |
| J | 7 | 12 |
| K | 16 | 9 |
| L | 24 | 18 |

b. The table below shows how 10 students arranged in alphabetical orders, were ranked according to their achievements in both practical an theory examinations in on IT course. Find the coefficient of ?? correlation. (5 marks)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Practical (x) | 8 | 3 | 9 | 2 | 7 | 10 | 4 | 6 | 1 | 5 |
| Theory (y) | 9 | 5 | 10 | 1 | 8 | 7 | 3 | 4 | 2 | 6 |

c. Represent this information using the most suitable diagram. (5 marks)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Months | July | Aug | Sept | OCT |
| Exports | 28 | 35 | 30 | 35 |
| Imports | 15 | 22 | 40 | 42 |