**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2016/2017**

**SECOND YEAR SECOND SEMESTER UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY**

**STA 2100: PROBABILITY AND STATISTICS**

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

**INSTRUCTIONS: ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER**

 **TWO QUESTIONS**

 **QUESTION ONE: 30 MARKS**

a. Define the following terms as used in probability:- [8 marks]

 i. Independent events.

 ii. Mutually exclusive events.

 iii. Conditional probability.

 iv. Population.

 v. Axiomatic approach.

 vi Classical approach.

b. A ransom variable x has the following probability distribution:-

 X 1.5 2.0 2.5 3.0

 PLX=x 2b Ab 3b b

Find the value of b and the respected value of x . [4 marks]

c. Kamau tosses a coin three times:- [6 marks]

i. Write down the probability space.

ii. What is the probability of Kamau getting at least two heads.

iii. What is the probability of Kamau getting at least 2 heads given that the first time the coins showed a head.

iv. Find the probability distribution of x, the number of head observe

d. i. Differentiate between primary data and secondary data. [2 marks]

 ii. Given two sources of each of the above data. [1 mark]

e. If P(A)=0.3, P(B)=0.4, P(ANB)=0.4, show that A and B are not independent. [2 marks]

f. For two events Q and R, P(Q)=3/5, P (R)= ¾ and P(QUR) =19/20, Complete:-

 i. P(QNR) [2 marks]

 ii. P(Q/R) [2 marks]

 **QUESTION TWO: 20 MARKS**

The following table shows the weight is kg of some electronics components manufactured by a company:-

 28.2 26.2 25.3 27.7 27.2 28.0 29.0 25.6

 27.4 26.4 24.7 26.6 26.8 28.3 27.0 28.9

 25.9 28.4 26.8 27.9 25.8 27.3 29.3 23.6

 25.1 28.7 26.4 25.8 25.3 24.9 26.3 26.6

 24.2 25.6 27.3 26.9 27.2 26.7 27.3 26.8

a. Find:-

 i. The Range (R) of the data.

 ii. n, the number of variables.

 iii. k, the number of classes.

 iv. i, the class interval.

 v. h, the smallest unit of measurement. [5 marks]

b. Use the above information to construct a grouped frequency distribution for the above data. [5 marks]

c. Use the frequency table to compute:-

 i. The mean.

 ii. **The mean.**

 iii. The standard deviation. [10 marks]

**QUESTION THREE:20 MARKS**

a. Seeds of three variations of tomatoes are scattered throughout a plot of land. Exactly 65% of the seeds are of variety. S1, 25% are of variety S2, 10% are of variety S3. Research has shown that 40% of the seeds of variety S1 with germinate, 50% of variety S2 will germinate and 60% of variety S3 will germinate. If a particular seed germinates what is the probability that it is of variety.

 i. S1

 ii S2

 iii S3 [14 marks]

b. i. Define the term statistical method. [2 marks]

 ii. Name four methods of collecting primary data. [4 marks]

**QUESTION FOUR: 20 MARKS**

a. Three events E1, E2 and E3 are defined in the some sample space. The events E1 and E3 are mutually exclusive. The events E1 and E2 are independent. Given that P(E1)=2/5, P(E3)=1/3 and P(E1 V E3)=5/8,. Find:-

 i. P(E1 V E2). [3 marks]

 ii. P(E2) [5 marks]

b. The discrete random variable W has a probability distribution as follows:-

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| W |  -3 |  -2 |  -1 |  0 | 1 |
| P/W=W | 0.1 | 0.25 | 0.3 | 0.15 | d |

 Find

 i. The value of d. [3 marks]

 ii. P(-3< W<O). [4 marks]

 iii. P(W>-1). [2 marks]

 iv. P1-1<W<1). [2 marks]

 v. Mode. [1 mark]

**QUESTION FIVE: 20 MARKS**

a. Explain the meaning of the following:-

 i. Positive and negative ……

 ii. Ill-mode [6 marks]

b. The table below gives monthly wage distribution:-

 Wage (Ksh./Month) Number:

35-45 15

45-55 23

55-65 42

65-75 52

75-85 76

85-95 107

95-105 220

105-115 82

115-125 14

125-135 2

Using the above figures, calculate the person’s measure of . Comment on your result. [14 marks]