



# THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

**A. M. E. C. E. A**

**MAIN EXAMINATION**

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**AUGUST – DECEMBER 2016 TRIMESTER**

**FACULTY OF ARTS AND SOCIAL SCIENCES**

**DEPARTMENT OF DEVELOPMENT STUDIES**

**WEEKEND PROGRAMME**

**SDS 311: STATISTICAL TECHNIQUES**

**Date: DECEMBER 2016**

**Duration: 2 Hours**

**INSTRUCTIONS: Answer Question ONE and ANY OTHER TWO Questions**

- Q1. a) What is the difference between Trial and Events in probability? **(2 marks)**
- b) Explain Null and Alternative Hypothesis. Show examples for each of them. **(4 marks)**
- c) Discuss the following as used in statistics.
- i) Cumulative Frequency distribution **(2 marks)**
- ii) Discrete frequency distribution **(2 marks)**
- d) The report on the number of days taken to clear the imported goods in a sea port is shown below:

Clearance (days)	Number of clearance done
Below 9 days	4
9-14	10
14-19	17
19-24	20
24-29	22
29-34	16
34-39	8

- i) Present the data in
- a) Histogram **(4 marks)**
  - b) Less than Cumulative Frequency curve **(4 marks)**
- ii) Calculate
- a) Arithmetic mean **(3 marks)**
  - b) Standard Deviation **(4 marks)**
  - c)  $P_{90}$  **(2 marks)**
- d) Discuss the relationship between Kurtosis and Normal distribution **(3 marks)**

- Q2. a) Differentiate between Descriptive and the Inferential statistics. Show examples. **(4 marks)**
- b) Silcult Perfumes Limited did a survey in 2014 so as to establish age groups which preferred their new perfume in the market.

Age (yrs)	No. of customers
20-30	8
30-40	12
40-50	7
50-60	5
60-70	3

Calculate the following measures and interpret your answers

- a) Pearson's coefficient of Skewness **(6 marks)**
  - b) Coefficient of Kurtosis **(10 marks)**
- Q3. a) Explain three probability laws that you know. **(6 marks)**
- b) In the outskirts of Nairobi, 5 households were interviewed. Their income and cost of their houses is as follows

Income (ksh000)	Cost of the house (Ks00000)
20	2
27	1
38	9
42	12
50	10
69	30
80	8
52	10

55	15
70	30

Calculate correlation coefficient and interpret your answer. **(8 marks)**

- c) Using suitable illustrations explain the following;
- a) positively skewed distribution **(2 marks)**
  - b) leptokurtic distribution **(2marks)**
  - c) perfect linear correlation **(2marks)**

Q4. a) In one of the catholic university's departments, the Head of Department claims to have had not less than 70% in end of trimester exams. To prove this claim, commission for University Education(CUE) randomly selected a sample of 35 Students' records and found it to have 69.5% and a Standard Deviation of 5 marks.

- i) Formulate the Null and the Alternative hypothesis for this claim. **(4marks)**
- ii) At 5% level of significance test the hypothesis and comment on your answer. **(6marks)**

b) A coin and a die were tossed simultaneously. Use the probability tree to calculate the following:

- i) probability of getting a Head and a three **(3marks)**
- ii) Probability of getting a Head and not six **(3marks)**

(c) Explain the importance of Statistic in:

- i) Business **(2marks)**
- ii) Social sciences **(2marks)**

Q5. a) in a certain public school the age of pupils in standard 7 was recorded as follows:

No of pupils	
Age(yrs)	No of pupils
10-12	20
12-14	22
14-16	14
16-18	6
18-20	2
20-22	2
	66

Calculate;

a) Medium

**(5marks)**

b) Geometric mean

**(8marks)**

- b) Compare Mean, Median and the Mode. Establish the condition necessary for use of each of them.

**(7marks)**

**\*END\***