



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

REGULAR PROGRAMME

**MPM 513 / MDS 516: STATISTICAL TECHNIQUES
MSO 502: SOCIAL STATISTICS**

Date: DECEMBER 2016

Duration: 3 Hours

INSTRUCTIONS: Answer ANY FOUR Questions

Q1. a) What is the difference between Mesokurtic and Platykurtic distributions?

(4 marks)

b) Where is it most suitable to calculate a statistic and a parameter? **(2 marks)**

c) Calculate the Mode and the Harmonic mean of the following distribution.

(5 marks)

16, 17, 19, 22, 19, 21, 25, 20, 18.

d) The following is a salary distribution for a sample of graduates in 2013

| Salary (Kshs000) | No. of graduates |
|---------------------|---------------------|
| 20-25 | 8 |
| 25-30 | 9 |
| 30-35 | 15 |
| 35-40 | 16 |
| 40-45 | 14 |
| 45-50 | 5 |
| 50-60 | 8 |
| 60-70 | 2 |

Calculate the Quartile three for the distribution

(4 marks)

- Q2. a) Interpret the following:
- (i) A coefficient of Kurtosis of -0.22 **(2 marks)**
 - (ii) A correlation coefficient of 0.62 **(2 marks)**
- b) Using relevant illustrations, explain the following:
- (i) Perfect Linear correlation **(2 marks)**
 - (ii) Positively skewed distribution **(2 marks)**
- c) After taking the weight of beef cattle in a ranch, the animals were fed with a brand of animal feeds and their weight gain recorded after two months.

| Weight (kg) | No. of cattle |
|-------------|---------------|
| 5-10 | 10 |
| 10-15 | 8 |
| 15-20 | 15 |
| 20-25 | 17 |
| 25-30 | 15 |
| 30-35 | 19 |
| 35-40 | 18 |
| 40-45 | 9 |

Calculate

- (i) the Standard Deviation **(4 marks)**
- (ii) the Geometric Mean **(3 marks)**

- Q3. a) Differentiate between Absolute and Relative Measures of dispersion. Give relevant examples. **(4 marks)**
- b) The table below shows the distribution of private time taken by students and their performance in Accounts.

| Time taken (hrs) | Scores (%) |
|------------------|------------|
| 10 | 68 |
| 5 | 72 |
| 9 | 62 |
| 15 | 88 |
| 25 | 80 |
| 20 | 79 |
| 22 | 90 |
| 14 | 57 |

- (i) Calculate the correlation coefficient and interpret the answer. **(7 marks)**
- (ii) Calculate the Y-intercept constant **(4 marks)**

- Q4. a) Establish the importance of statistics in the following:
- (i) Study of the celestial bodies **(2 marks)**
 - (ii) Marketing **(2 marks)**
 - (iii) Social Sciences **(2 marks)**
- b) In the Kenyan Government, Ministries and Departments take different amounts of time to pay for goods supplied to them. The table below shows the distribution of time taken by departments in four randomly selected counties.

| Days taken | No of departments |
|------------|-------------------|
| 9-14 | 20 |
| 14-18 | 34 |
| 18-22 | 20 |
| 22-26 | 22 |
| 26-30 | 16 |
| 30-34 | 8 |
| 34-38 | 3 |
| 38-42 | 8 |

Calculate Pearson's 1st Skewness coefficient. Comment on your answer. **(9 marks)**

- Q5. a) Following the age of the recent applicants for Kenya's next Chief Justice Position, a group of the social activists interviewed 2500 Kenyans to establish the preferred age of future Chief Justices. The Distribution is as follows:

| Age (yrs) | No. of respondents |
|-----------|--------------------|
| 30-35 | 300 |
| 35-40 | 310 |
| 40-45 | 400 |
| 45-50 | 390 |
| 50-55 | 300 |
| 55-60 | 410 |
| 60-65 | 200 |
| 65-70 | 150 |
| Above 70 | 40 |

Calculate the coefficient of Kurtosis and interpret your answer. **(8 marks)**

- b) The Public service commission of X Country submitted 10 names of interviewees for appointment of two as the Director and Deputy Director of the Forestry Department. Out of the 10 candidates, 6 of them were men.
- (i) What are the Probability's possible events? **(1 mark)**
 - (ii) What is the probability that both would be women? **(3 marks)**
 - (iii) What is the probability that they would be a man and a woman? **(3 marks)**
- Q6. a) A motor cycle manufacturer gives a guarantee that their engines take around 3 years still in good working condition. Within that period, they consume 1 litre of petrol to cover 100km. An inspector from motor vehicle inspectorate took a sample of 50 motor cycles for a test and found they cover a mean of 99.2km per litre of petrol with a standard deviation of 0.005km.
- (i) What are the Null and the Alternative hypotheses for this claim? **(2 marks)**
 - (ii) At an error margin of 5%, test the manufacturers' claim and interpret the results. **(5 marks)**
- b) Establish the relationship between the following:
- (i) Correlation and regression **(2 marks)**
 - (ii) Descriptive and Inferential statistics **(2 marks)**
- c) With the help of relevant examples, show where the following would be applied.
- (i) Median **(2marks)**
 - (ii) Geometric Mean **(2 marks)**

END