



# UNIVERSITY OF EMBU

2016/2017 ACADEMIC YEAR

FIRST SEMESTER EXAMINATION

SECOND YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE

ACS 206 /AEB 203: STATISTICS 1

**DATE: DECEMBER 5, 2016**

**TIME: 8:30-10:30AM**

**INSTRUCTIONS:**

**Answer Question ONE and ANY other TWO Questions**

**QUESTION ONE (30 MARKS)**

- a) Define the following terms; (5 marks)
- i) Statistics
  - ii) Probability
  - iii) Median
  - iv) Mean
  - v) Variance
- b) State any three sources of secondary data collection methods. (3 marks)
- c) State the five random or probability sampling methods (5 marks)
- d) Distinguish a parameter from a statistic (4 marks)
- e) Find the probability of getting 4 heads and 6 tails in 10 flips of a fair coin (4 marks)
- f) From the frequency distribution below, draw a histogram and estimate the mode. (5 marks)

Mass(kg)	frequency
20-29	2
30-39	4
40-49	1
50-59	6
60-69	3

g) The number of people who become ill each year from eating a kind of poisonous plant in a certain region is a random variable having a Poisson distribution with  $\lambda = 1.6$ , find the probability of;

- i. 2 such illnesses in a given year.
- ii. At least 3 such illnesses in 5 years (4 marks)

**QUESTION TWO (20 MARKS)**

a) A bag contains 6 red and 4 white balls .determine the probability of drawing two white balls in succession without replacement. (4 marks)

b) State any four qualities of a good questionnaire. (4 marks)

c) Given the following frequency distribution, find the (12 marks)

- i) Mean    ii) mode    iii) median.    iv) Variance

Class	5-9	10-14	15-19	20-24	25-29	30-34
frequency	4	9	16	12	6	3

**QUESTION THREE (20 MARKS)**

a) Briefly explain the meaning and significance of correlation (5 marks)

b) Differentiate between; i) *discrete* and *continuous* data

ii) Qualitative and quantitative data as used in statistics (4 marks)

c) Given that  $f(x) = \begin{cases} \frac{c}{\sqrt{x}}, & 0 < x < 4 \\ 0, & \text{elsewhere} \end{cases}$  ,find the value of c and  $E(x)$  (6 marks)

d) A binomial random variable has  $\mu=50$  and standard deviation =5, find the values of n and p (5 marks)

**QUESTION FOUR (20 MARKS)**

a) Distinguish between *skewness* and *kurtosis* as applied in statistics. (4 marks)

b) What is the probability that in 10 tosses of a fair coin, exactly 5 come down as heads. (6 marks)

c) The daily water usage per person in Thika is normally distributed with a mean of 20 gallons and a standard deviation of 5 gallons. What is the probability that a person from Thika selected at random will use;

- i. Less than 20 gallons per day?
- ii. More than 30 gallons per day?

(10 marks)

**QUESTION FIVE (20 MARKS)**

The table below shows driving experience and monthly insurance premium of eight drivers.

Driving experience in (years)- x	Monthly insurance premium (\$)- y
5	64
2	87
12	50
9	71
15	44
6	56
25	42
16	60

- a) Plot a scatter diagram.
- b) Find the least square regression line and predict the monthly insurance premium for a drive with 10 years experience.
- c) Determine the correlation coefficient and explain what it means. (20 marks)

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