



WI-2-60-1-6
JOMO KENYATTA UNIVERSITY

OF
AGRICULTURE AND TECHNOLOGY

SECOND YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF

LAND RESOURCES PLANNING AND MANAGEMENT.

STA 2260. STATISTICS

DATE: DECEMBER 2016

TIME 2 Hours

Answer question one and any other two questions.

Question one (30 marks)

a) Define the term statistics and explain the two broad categories of statistics (4 marks)

b) Given the following data, obtain the Spearman's rank correlation coefficient

X	50	48	65	68	47	75	57	79	46	62
Y	45	40	49	52	35	57	44	62	39	45

(5 marks)

c) Give a brief distinction between mean absolute deviation and quartile deviation. Hence obtain the quartile deviation and the mean absolute deviation for this data below

19, 13, 14, 12, 11, 15, 18, 14, 17, 13, 19

(7 marks)

d) Organize the data below into a grouped frequency table and find the mode of the data.

15.0 17.4 10.3 9.2 20.7 18.9 16.6 22.4 23.7 18.6 26.1 16.5 19.7 12.9

15.7 30.8 15.4 20.3 24.0 29.6 18.3 23.7 17.8 24.6 23.0 21.4 32.8 12.5

17.5 18.3 23.2 21.6 20.8 29.8 24.5 28.4 13.5 17.1 27.1 27.9 (10 marks)

e) The following table shows the frequency distribution of the diameters of 52 seedlings.

Class	Frequency
35-39 mm	6
40-44 mm	12
45-49 mm	15
50-54 mm	10
55-59 mm	9

(Lengths have been measured to the nearest millimetre). Draw a histogram and fit a frequency polygon on the same axis for this data (5 marks)

Question Two (20 marks)

a) Explain the following terms as used in hypothesis testing

- i) Null hypothesis and alternative hypothesis (2marks)
- ii) Type I error and type II error (2 marks)
- iii) Level of significance and P.value (2 marks)

b) Consider the following samples from two independent populations

Course A	0	2	2	3	3	5
Course B	3	6	6	7	8	

Assuming equal population variances make an inferential comparison of means. (6 marks)

c) The expected value of the following Probability distribution is 7. Determine the values of r and t hence find the variance of X . (7 marks)

X	5	6	7	8	9
$P(X=x)$	0.20	r	$2r$	0.15	t

Question Three (20 marks)

- a) The following table gives the marks of 58 students in Statistics. Calculate the average marks and the standard deviation of this group.

Marks	No. of students
0-10	4
10-20	8
20-30	11
30-40	15
40-50	12
50-60	6
60-70	2

(10 marks)

- b) Fit a regression equation for the data

Month(x):	1	2	3	4	5	6	7	8	9	10
Height(y):	52.5	58.7	65	70.2	75.4	81.1	87.2	95.5	102.2	108.4

$y = a + bx$ $b = \frac{\sum xy - \bar{x}\bar{y}}{\sum x^2 - n\bar{x}^2}$ (6 marks)

pays Ksh 5,000 each and some garden men who receives Ksh 7,000 each. If he pays out an average of Ksh 5,700 per month to these people, find the number of garden men.

(4 marks)

Question four (20 marks)

- a) In a nationwide survey, 100 boys and 50 girls are sampled. For boys, the average number of absences in the first year is 15 with a standard deviation of 7; for girls, the average number of absences is 10 with a standard deviation of 6. What is the mean and standard deviation of absences for the entire group of 150 students? (5 marks)
- b) At a school fair, visitors enter a 'Guess the weight of the cake' competition. Their guesses, rounded to the nearest 100 grams, were recorded in the following table:

Guess (kg)	10.5 - 10.7	10.8 - 11.0	11.1 - 11.3	11.4 - 11.6	11.7 - 11.9
Frequency	5	32	26	11	6

Find the geometric and harmonic mean of the guessed weight (4 marks)

- c) Briefly explain the difference between skewness and kurtosis hence illustrate graphically the three types of skewness and the three types of kurtosis (5 marks)

d) Using your calculator, determine the mean and standard deviation of the data
31 35 29 36 25 29 48 46 28 47 42. Hence find;

i) The coefficient of variation C.V (X)

(3 marks)

ii) The kurtosis $k = \frac{\sum (x - \bar{x})^4}{n s^4}$.

(3 marks)