



(Knowledge for Development)

KIBABII UNIVERSITY
UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR
FIRST YEAR SECOND SEMESTER
MAIN EXAMINATION

FOR THE DEGREE OF BACHELOR OF SCIENCE

COURSE CODE: STA 106

COURSE TITLE: BASIC STATISTICS

DATE: 09/08/18

TIME: 9 AM -11 AM

INSTRUCTIONS TO CANDIDATES

Answer Question One and Any other TWO Questions

TIME: 2 Hours

This Paper Consists of 6 Printed Pages. Please Turn Over.

QUATION ONE

a) Define the following terms

(i) Discrete data (1mark)

(ii) Continuous data (1mark)

(iii) mode (1marks)

(iv) back to back stem plot (2marks)

(b) The grouped frequency distribution records the masses, to the nearest grams, of 84 letters delivered by a postman

Mass(g)	1-20	21-40	41-60	61-80	81-100
Number of letters	10	18	24	14	18

Draw a histogram to illustrate these data (5marks)

(c) Sketch a graph of a

(i) Positive and a negative skew of a frequency curve (2marks)

(ii) Uniform distribution (2marks)

(d) To obtain grade A , Ben must achieve an average of at least 0 in five test. If his average marks for the first four test 68, what is the lowest marks he can get in his fifth test and still obtain grade A

(4marks)

(e) Sketch the graphs of

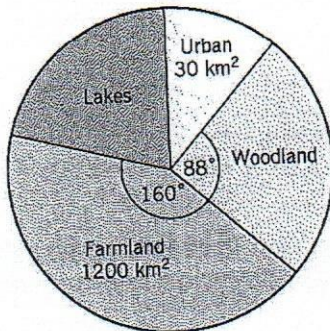
(i) Positive linear correlation (2marks)

(ii) Negative liner correlation (2marks)

(iii) No correlation (2marks)

(f)

(i) The pie chart below shows the distribution of land and water in a certain country



Determine

- (i) The area of woodland (2mks)
- (ii) The angle of urban (2mks)
- (iii) The total area of the land (2mks)

QUESTION TWO

(a) The maximum temperature of in $^{\circ}\text{C}$ measured to the nearest degree was recorded each day during June was recorded as follows

19	23	19	19	20	12	19	22	22	16	18	16	19	20	17	13	14	12	15	16	17
19	22	22	20	19	19	20	20													

Draw a 9 interval stem and leaf diagram to illustrate the temperature giving the modal class (5marks)

- (b) Draw a frequency polygon to illustrate frequency distribution of the time taken by 31 competitors to complete a marathon run.

Time	$25 \leq t < 30$	$30 \leq t < 35$	$35 \leq t < 40$	$40 \leq t < 50$	$50 \leq t < 65$
Frequency	4	12	8	4	3

(6mrks)

- (c) The rules for a flower completion at a village fate are as follows

The judges each give a score of 100 for each entry. The two judges whose ranking are close are identified, and their score for each entry are added. The three prize winners are those whose total score from the judges are highest. The score of the third judge ignored. The table below shows judges awarded marks

contestant	A	B	C	D	E	F	G
Judge x	89	83	80	72	69	54	41
Judge y	77	84	85	65	79	72	69
Judge z	73	83	89	80	67	75	69

The value of spearman's rank correlation coefficient between x and y is 0.5 and between x and z is 0.4, calculate correlation coefficient between y and z, and establish the three prize winners.

(10mrks)

QUATION THREE

- (a) Three statistics students, Ali, Les and Sam spent their time fishing. They caught three types of fish and recorded the type and mass to the nearest 0.01 kg of each fish caught. There result was as follows

	Number of fish by type			All fish caught	
	perch	tench	rech	Mean mass(kg)	Standard deviation(kg)
Ali	2	3	7	1.07	0.42
Les	6	2	8	0.76	0.27
Sam	1	0	1	1.00	0

- (i) State how it might be deduced from the data that the mass of each fish caught was 1.00 kg (2marks)
- (ii) Determine who caught the highest number of fish. (4marks)
- (iii) Determine the mass of fish Sam caught late the changed the standard deviation to 1.00 kg (4marks)

(b) If the mass y (grams) is related to time x (minutes) in a chemical reaction. Determine the values of

(i) Mean of x and y (2marks)

(ii) S_{xy} (2marks)

(iii) S_{xx} (2marks)

(iv) The equation of regression (2marks)

(v) The members of an orchestra were asked how many instruments each would play and the following results were obtained.

2,5,2,4,1,1,1,2,1,3,3,2,1,2,1,1,2,4,3,2,1,2,3,1,4,2,3,1,1,2

(vi) Find the number of instruments played (2marks)

QUATION FOUR

(a) The table below shows, in millions of pounds, the sales of a company in two successive years

year	Africa	America	Asia	Europe
First	5.5	6.5	13.2	19.6
second	5.8	15.2	9.2	29.8

Draw two pie charts which allow the total sales to be compared. (6marks)

(b) The table below represent the pulse rate p of reg and norman at times t after exercises.

t	0.5	1.0	1.5	2.0	3.0	4.0	5.0
p	125	113	102	94	81	83	71

(i) Draw a scatter diagram to represent this information (4marks)

(ii) If the regression equation is given as $p=1.22=11.0t$, determine the normans pulse rate 2.5 minutes after stopping the exercise (4marks)

(iii) If the full data for regs exercise is given as $\sum t=19.5$, $n=8$, $\sum t^2=63.75$, $\sum p=829$, $\sum pt=867$ find the equation of regression for line p on t for regs data (6marks)

QUATION FIVE

(a) From the table given below of stem and leaf

(i) The widths of metal components

Key 1 | 2 means 1.2cm

(ii) The reaction time of 30 volunteers

Key 1 | 2 means 12 hundredth of a second

(iii) The attendance of 30 matches

Key 1 | 2 means 1200 people

stem	leaf
0	7
0	9
1	0 1
1	2 2
1	4 4 4 5 5
1	6 6 7 7 7
1	8 8 8 8 9 9 9
2	0 0 1 1
2	2 3
2	4

For each of the keys given determine the value ringed and the its width (6marks)

(b) A cumulative percentile was formed from the following masses measured to the nearest kilogram.

Mas (kg)	≤ 59.5	≤ 64.5	≤ 69.5	≤ 74.5	≤ 79.5	≤ 84.5	≤ 89.5
Cumulative frequency	0	4	16	40	68	88	100

- (i) Draw a cumulative frequency curve (4marks)
- (ii) Determine the median (2marks)
- (iii) Determine the lower quintile (3marks)
- (iv) Determine the upper quartile (3marks)
- (v) Determine the inter quartile range (2marks)