

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN MATHEMATICS

MATH 142: EXPLORATORY DATA ANALYSIS

STREAMS: BSC

TIME: 2 HOURS

DAY/DATE: TUESDAY 11/12/2018

8.30 A.M. – 10.30 A.M.

INSTRUCTIONS:

Answer question ONE (compulsory) and any other two questions.

QUESTION ONE (30 MARKS)

(a) Briefly distinguish between descriptive and inferential statistics. (4 marks)

(b) A farmer recorded the mass of 25 timber as follows

10	14	12	10	12	11	11	9	13
16	13	9	12	13	12	10	15	
10	9	11	8	14	12	8	11	

(i) Create a frequency table for the data. (3 marks)

(ii) Determine the mean and standard deviation. (6 marks)

(c) Calculate the ranks correlation coefficient for the following data on two tests.

X	84	77	62	54	93	86
Y	73	85	53	58	84	90

Comment on the correlation between X and Y (6 marks)

- (d) The table below shows the reactions speeds in words per minutes of a sample of 90 adults.

Speed	121-140	141-160	161-180	181-200	201-220	221-240	241-260
Frequency	2	6	21	26	18	9	4

Draw a histogram and frequency polygon on the same axes. (5 marks)

- (e) The following data shows the annual sales reported by the four companies in Kenya.

	Sales (Kshs million)			
	X	Y	Z	W
2015	250	150	250	200
2016	200	180	200	250
2017	150	200	150	150

Required

Present the information in a bar chart. (6 marks)

QUESTION TWO (20 MARKS)

- (a) Outline four functions of statistics in management science. (14 marks)

- (b) A farmer recorded the mass of 30 bull as follows

312	328	348	325	351	324	303	335	320	334
301	316	326	350	310	308	312	315	326	340
342	300	327	328	341	350	340	327	352	324

Required

Plot s stem and lead display diagram. (8 marks)

- (c) A survey was carried out at a particular point in time to know the number of skilled and unskilled labour in some companies. The result is presented in the table below.

Companies	Skilled labor	Unskilled labour
Rostol	120	80
Olassums	240	160
Headet	110	100
Makov	130	110
Solae	200	350

Required: Present the above information in a components bar chart. (8 marks)

QUESTION THREE (20 MARKS)

- (a) Outline the importance of regression analysis in management of science. (4 marks)
- (b) The following are weight and heights of a group of seven students taking exploratory data analysis and basic mathematics course.

Weight	Y	56	60	62	65	70	80	90
Height	Y	138	148	150	156	153	160	173

Required:

- (i) Fit a least squaring line $Y=C+MX$ (8 marks)
- (ii) Estimate the height when the weight is 58 kg. (2 marks)
- (iii) Obtain the Pearson correlation coefficient. (3 marks)
- (iv) Obtain coefficient of determination. (3 marks)

QUESTION FOUR (20 MARKS)

- (a) Explain briefly the methods used in gathering primary data.
- (i) Interview (3 marks)
- (ii) Direct observation (3 marks)
- (iii) Questionnaires (3 marks)
- (b) The table below shows the average earnings in (Ksh thousands) of 40 employs in a firm.

Earnings	20-29	30-39	40-49	50-59	60-69	70-79	80-89
Number	6	5	7	10	5	4	3

- Calculate (i) Mean absolute deviation (4 marks)
- (ii) Quartile deviation (3 marks)
- (iii) Variance (4 marks)

QUESTION FIVE (20 MARKS)

The data below shows the height to the nearest (cm) of 100 seedlings in a nursery.

33	68	31	36	16	34	56	38	43	52
24	49	76	52	36	85	4	44	56	19
46	38	7	34	65	44	95	63	30	22
11	29	48	50	27	31	24	29	14	39
43	86	55	15	69	43	52	17	45	65
37	42	46	67	32	58	34	89	47	28
24	16	32	31	6	45	28	67	29	52
35	37	43	63	56	25	48	55	78	49
73	48	59	18	38	77	35	26	33	31
26	40	38	25	26	39	72	13	08	24

Required

- (a) Using the class 1-10, 11-20 etc. create a frequency distribution table for the data. (5 marks)
- (b) Draw a frequency distribution curve (ogive) on the graph paper provided. (5 marks)
- (c) Use the curve constructed above to determine
- (i) Median (2 marks)
 - (ii) Lower and upper quartile (4 marks)
 - (iii) 6th decile (2 marks)
 - (iv) The number of seedlings to be transplanted if any seedlings having height of 35cm and above has to be transported. (2 marks)