

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATION
RESIT/SUPPLEMENTARY / SPECIAL EXAMINATIONS
EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE**

MATH 142: EXPLORATORY DATA ANALYSIS

STREAMS: BSC

TIME: 2 HOURS

DAY/DATE: WENESDAY 03/11/2021

2.30 P.M - 4.30 P.M.

INSTRUCTIONS:

- *Answer all the questions*

QUESTION ONE

- a.* Outline the main objective of statistics in a scientific study. [2 marks]
- b.* Consider the two frequency distribution given below, where the mean from the first and second data is 10.66 and 13.5 respectively. Find the value of **a** and **b** [8 marks]

Class	5-8	9-12	13-13	17-20	21-24
F_1	20	15	10	a	b
F_2	4	8	4	2a	b

- c.* Below you are given the ages of 50 workers in a factory

32	45	53	44	76	47	86	55	66	48	31	23	52
72	17	35	65	13	63	52	29	56	57	64	58	46
69	50	57	25	61	42	26	33	46	45	38	55	
63	41	80	36	78	56	38	19	83	40	43	22	

Required

Plot a stem and leaf Display [6 marks]

- d.* The times taken by a group of people to solve a puzzle are as shown below.

Time(s)	10-14	18-19	20-24	25-29	30-34	35-39	40-44	45-49
Frequency	1	3	7	10	15	12	6	2

Compute

i. Mean	ii. Median	iii. Mode	iv. 5 th Decile
v. Mean absolute deviation	vi. Semi-interquartile range	vii. Variance	

[14 marks]

QUESTION TWO

- a. Two Judges A and B of an international competition award marks given in the table below

	X	Y	W	Z	P	Q	R
A	5.8	5.5	5.9	4.9	5.9	5.6	5.0
B	5.5	5.4	5.8	5.3	5.7	5.7	5.7

Calculate the spearman's rank correlation [8 marks]

- b. The demand and prices (in Kshs thousands) for a bag of a hybrid 100kg bag of wheat in different regions of the country is as shown below.

Price(X)	56	60	62	65	70	80	90
Demand (Y)	138	148	150	156	153	160	173

(a). Fit a least square regression line ($Y=c+mX$) [6 marks]

(b). Suppose that you found a bag in one of the shops of the same kind of wheat costing Kshs 58,000, what would you approximate its demand in that area to be? [2 marks]

(b). Compute Pearson moment correlation coefficient [4 marks]

QUESTION THREE

- a. A bag contains 8 white and 3 red disks. If two disks are drawn at random, Find the probability that

- i. both are white
- ii. one is of each colour [6 marks]

b. Toss two dice $S = \{(X_1=1, \dots, 6); (X_2=1, \dots, 6)\}$ Define

$$A = \{(X_1, X_2) : X_1 + X_2 \leq 4\}$$

$$B = \{(X_1, X_2) : X_1 + X_2 \text{ is odd}\}$$

Find the probability that $X_1 + X_2$ is odd given $X_1 + X_2 \leq 4$. Use the event notation A and B

[14 marks]

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