MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF PURE, APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MATHEMATICS AND ACTUARIAL SCIENCE

UNIVERSITY POSTGRADUATE EXAMINATION

2023/2024 ACADEMIC YEAR

FIRST YEAR **SECOND** SEMESTER EXAMINATION FOR MASTER OF SCIENCE IN TOURISM MANAGEMENT

MTH 517 – QUALITATIVE AND QUANTITATIVE DATA ANALYSIS

DURATION: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. Answer ANY FOUR questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

QUESTION ONE (25 MARKS)

a. The grade of a class of 9 students on a midterm report (x) and on the final examination (y) are as follows:

x	77	50	71	72	81	94	96	99	67
y	82	60	78	34	47	85	99	99	68

i. Estimate a simple linear regression line of y on x using the method of least squares. (6marks)

ii. Estimate the final examination grade of a student who received a grade of 85 on the mid-term report. (2marks)

iii. Find the sample correlation coefficient and interpret it. (5marks)

b. The weights of college students were presented in frequency distribution given below:

Weight:	118-126	127-135	136-144	145-153	154-162	163-171	172-180
F :	3	5	9	12	5	4	2

Calculate the:

i. Mean (3marks)

ii. Median (3marks)

iii. Mode (3marks)

iv. Based on the results of above comment on the shape of the distribution. (1mark)

c. If we defined $s = \sqrt{MSE}$, then of which parameter is S an estimate. (2marks)

QUESTION TWO (25 MARKS)

a. Discuss Five popular qualitative data analysis tool giving tow benefits and two challenges. (10marks)

b. Three sets of Five mice were randomly selected to be placed in a standard maze but with different color doors. The response is the time required to complete the maze as seen below. Perform the appropriate analysis to test if there is an effective due to color. $(use\ d = 0.01)$

Color				Time	
Red	9	11	10	9	15
Green	20	21	23	17	30
Black	6	5	8	14	7

(15marks)

QUESTION THREE (25 MARKS)

a. There are a few main types of multidimensional scaling (MDS), and they are typically classified based on the kinds of distances they preserve and the transformations they use.

i. Discuss any Five of them. (10marks)

ii. Discuss Four applications (4marks)

b. The time (in seconds) taken by a group of students to solve a puzzle are given below

Time:	210-214	215-219	220-224	225-229	230-234
Freq:	1	3	7	10	15

235-239	240-244	245-249
12	6	2

i. Mean (3marks)

ii. Median (2marks)

iii. Mode (2marks)

iv. Standard Deviation (4marks)

QUESTION FOUR (25 MARKS)

a. The times required by three workers to perform an assembly-line task were recorded on five randomly selected occasions. Given below are the times, to the nearest minute.

Hank	Jotin	Susan
8	8	10
10	9	9
9	9	10
11	8	11
10	10	9

i. Construct the one-way ANOVA table for the data. (7marks)

ii. Compute SSTV and SSE using the defining formulas. (7marks)

b. For the following frequency distribution

Class:	5-9	10-14	15-19	20-24	25-29	30-34	35-39
F:	1	4	6	17	16	4	2

Calculate the:

i. Range (2mks)

ii. Standard deviation (3marks)

c. What are the benefits of using Atlas TI as qualitative data analysis tool? (4marks)

d. Clearly differentiate between two types of qualitative data. (2marks)

QUESTION FIVE (25 MARKS)

a. Explain the reason for the word variance in the phrase analysis of variance. (2marks)

b. The following measurements show the respective heights in inches of ten fathers and their eldest sons.

Father (x)	67	63	66	71	69	65	62	70	61	72
Son (y)	68	66	65	70	69	67	64	71	60	63

i. Find the least squares regression line of son's heights on father's height. (5marks)

ii. Calculate correlation coefficient and interpret it. (5marks)

c. The chamber of commerce conducted a survey amongst 16 furniture retailers to identify the percentage of bad debts in each of the company's debtor's book. The bad debts percentages are as follows:

2.2, 4.7, 6.3, 5.8, 5.7, 7.2, 2.6, 2.4, 6.1, 6.8, 2.2, 5.7, 3.4, 6.6, 1.8, 4.4

Calculate the variance and standard deviation. (5marks)

d. Discuss Four basic research designs. (8marks)