KISII UNIVERSITY
UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF
MASTER OF ARTS IN GEOGRAPHY
FIRST SEMESTER, 2021/2022
(FEBRUARY - JUNE, 2022)

GEOG 812: ADVANCED QUANTITATIVE TECHNIQUES

STREAM: Y1 S1   **TIME: 3 HOURS**

DAY: MONDAY, 9:00 – 12:00 P.M.   **DATE: 30/05/2022**

INSTRUCTIONS
1. *Do not write anything on this question paper.*
2. *Answer any other THREE Questions.*

QUESTION ONE

The following table presents measured temperature and electricity consumption of one household on selected days of a month in a household in Kisii.

Temperature (°C)	Electricity (kwh)
-6	56
28	21
6	30
10	30
19	45
10	45
30	12
48	5
40	10
32	15
27	14
17	35
19	26

25	18
26	19
27	19
30	23
-2	49
0	50

From the table:

a. Prepare a complete table to correlate and regress the above data. Round off your answers to the nearest whole numbers before using them in the table. (12 Marks)

b. Calculate the means for both the electricity and temperature.(2 Marks)

c. Calculate the variances for both the electricity and temperature. (2 Marks)

d. Calculate the standard deviations for both the electricity and temperature. (2 Marks)

Calculate the Y-intercept for the data. (2 Marks)

QUESTION TWO

A household wanted to know if using a bath a bath had a significant difference compared to using a show and made observations on their monthly water consumption (in Kiloliters) over 26 months as presented below:

Bath

32.8 31.9 36.6 35.6 36.1 29.8 34.5 34.3 39.9 33.4 40.2 27.6 32.0
50.7 21.6 27.9 34.2 41.1 43.1 36.7 41.5 33.7 34.3 31.4 31.8 48.1

Shower

20.5 28.6 11.6 21.7 22.5 33.2 29.6 22.9 21.5 20.1 18.8 17.9 22.6
22.3 29.3 23.1 20.3 12.6 17.6 32.1 15.7 23.8 27.9 10.5 14.3 16.6

At 0.05, test whether there is any significant difference in the variances of the two consumptions using the F-test. Round off all your answers to the nearest two decimal places. Use the closest degrees of Freedom, if the exact one is not there on the table. (20 Marks)

QUESTION THREE

The following represent extract of students ages for the second and third years from a class in Kisii University. Test whether there is a significant difference between the mean ages at 0.05 rejection level. (20 Marks)

First Years

18	26	24	18	21	23	18	20	22	24	17	24	26
26	18	28	23	23	17	22	20	16	21	21	30	23

Second Years

28	23	24	29	30	23	28	32	22	22	24	19	24
22	22	30	26	21	23	28	25	31	26	24	22	27

QUESTION FOUR

The following is an extract of a student marks from a set of subjects. Test whether there is any significant difference between the expected marks and the marks that the students scored. (20 Marks)

Subject number	Marks obtained	Expected Mark
1	42	45
2	41	42
3	50	50
4	60	76
5	58	59
6	65	78
7	60	50
8	62	75
9	54	55
10	90	65
11	65	75
12	81	78
13	45	55
14	32	55
15	45	65
16	90	88

17	52	60
18	65	70
19	85	90
20	48	55
21	58	65
22	50	50
23	59	67
24	47	50
25	65	77
26	23	50
27	32	60
28	40	58
29	56	69
30	48	60

QUESTION FIVE

a. Explains the differences between Mann Whitney U-test and the student t test.   (4 Marks)

b. Outline and explain prerequisites of using Mann Whitney U-test as an analysis technique.   (8 Marks)

c. Based on the following set of data tests if there is a difference in the rank of the two sets using Mann Whitney U-test at 0.05.   (8 Marks)

Set 1	Set 2
5	9
8	12
6	3
1	13
2	12
10	8

QUESTION SIX

The following table presents depression scale.

No exercise	Jogging for 40 minutes	Running for 20 minutes
23	22	59
26	27	66
51	39	38
49	29	49
58	46	56
37	48	60
29	49	56
44	65	62

By the use of Kruskal Wallist test determine if the three scales are significantly different. (20 Marks)