(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY
(MMUST)
MAIN CAMPUS

UNIVERSITY MAIN EXAMINATIONS

2021/2022 ACADEMIC YEAR

FIRST YEAR FIRST SEMESTER

FOR THE DEGREE
OF
MASTER OF SCIENCE (ECONOMICS)

COURSE CODE: ECO 802

COURSE TITLE: QUANTITATIVE ANALYSIS

DATE: THURSDAY, 4TH AUGUST 2022 TIME: 2:00 – 5:00PM

INSTRUCTIONS TO CANDIDATES

1. This paper contains TWO Sections: Sections I and II
2. Answer Question ***ONE*** and Any other ***THREE*** Questions in the Answer Booklets Provided
3. All rough work must be done in the Answer Booklet and Cancelled
4. Normal, Chi square, ANOVA, t distributions tables are provided.

TIME: 3 HOURS

MMUST observes ZERO tolerance to examination cheating

SECTION I: COMPULSORY (40 MARKS)

(Answer ALL Questions from this Section)

a) A policy analyst claims that the mean income of all working females has increased. A survey of 20 working females reveals an average income of Kenya shillings 400 per week. In a previous census this population showed a mean income of Kenya shillings 380 and a variance of Kenya shillings of 2,500. Test the claim at 5% significance level. (10 marks)

b) The following data shows the total cost (C) and output (Q) from five plants in a certain industry

Total Cost (C)	40	60	50	70	90
Output (Q)	4	6	7	10	13

Assuming a simple linear relationship between total cost and output, estimate the cost function (10 marks)

c) Describe with examples relevance of quantitative analysis in decision making in management (10 marks)

d) The number of workers employed, the mean wage (K£) per week and the standard deviation in each branch of Kenya commercial bank Limited are given below.

Branch	No. of workers employed	Weekly mean wage (K£)	Standard deviation (K£)
Nakuru	50	1413	60
Meru	60	1420	70
Garissa	90	1415	80

Required:

i) Which branch shows greater variability in the distribution of wages? (3 marks)

ii) Calculate mean wages and standard deviation of all the workers taken together for Kenya commercial bank Limited. (7 marks)

SECTION II (60 MARKS)

(Answer Any THREE Questions from this Section)

QUESTION TWO

A study on the relationship between education level and marital stability was conducted where marital stability was classified as low, medium, and high. The findings are in the contingency table

Education Level	**Marital Stability**		
	Low	**Medium**	**High**
Primary	20	18	22
Secondary	50	46	44
College	48	63	59
University	34	43	73

Test at $\alpha = 0.05$ level of significance if the marital stability is related to education level using Chi square distribution (20 marks)

QUESTION THREE

The following are the number of suits made by a sample of employees in factories A and B of a company in six months:

Factory A:	27	31	28	29	40	35	33	32	36	37	43
Factory B:	34	24	38	28	30	34	37	42	41	44	

Test whether the average is the same for employees in both factories using Mann- Whitney test 5 percent significance level (20 marks)

QUESTION FOUR

Independent random samples of rental rates of houses in four cities estates were taken. The rental rates in thousands of shillings are shown below:

Milimani	Otiende	Amalemba	Kifingo
73	85	97	61
63	59	86	67
89	84	76	84
78	70	78	67
70	80	76	69

Required:

a) Construct an Analysis of Variance (ANOVA) table (15 marks)

b) Test if there is any significant difference in rental rates within the estates and between the estates at $\alpha = 0.01$ level of significance (05 marks)

QUESTION FIVE

The following data was obtained during an educational survey conducted in a given sub-county school regarding scores obtained by fifty students in a certain subject

School	A	B	C	D	E	F	G	H	J	K
Scores	42	38	52	61	40	32	28	41	38	30
Number of students	5	6	8	4	3	5	4	5	3	7

Required;

a) Calculate the coefficient of quartile deviation **(10 marks)**

b) Compute the harmonic mean **(6 marks)**

c) Compute the geometric mean **(4 marks)**

QUESTION SIX

A certain farmer in Kakamega has decided to apply two brands of fertilizer namely, Super Grow and Crop-Quick in his maize farm. The field requires at least 16 Kilograms of nitrogen and 24 Kilograms of phosphate. Super- Grow costs Sh. 600 per bag and Crop- Quick Sh. 300 per bag. The following information on chemical contribution is given.

Brand	Nitrogen Kilogram/ Bag	Phosphate Kilogram/ Bag
Supe- Grow	2	4
Crop- Quick	4	3

a) How much of each brand should this farmer purchase to minimize total cost of fertilizer given (10 marks

b) Below is the distribution of reports the volume of sales by 120 salespersons in the month of September 2021:

Sales (Sh.)	Number of Salespersons
100,000 to 149,000	8
150,000 to 199,000	14
200,000 to 249,000	16
250,000 to 299,000	18
300,000 to 349,000	20
350,000 to 399,000	17
400,000 to 449,000	15
450,000 to 499,000	12

Required:

i) Choosing a suitable assumed mean calculate the mean (06 marks)

ii) Calculate the standard deviation of the distribution (04 marks)