



(The University of Choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

UNIVERSITY EXAMINATIONS

2021/2022 ACADEMIC YEAR

FIRST YEAR SECOND SEMESTER

MAIN EXAMINATION

**FOR THE DEGREE OF
MASTER OF EDUCATION IN EDUCATIONAL
PLANNING/ ECONOMICS OF EDUCATION/EDUCATIONAL
MANAGEMENT AND POLICY STUDIES**

COURSE CODE: EPM 804

**COURSE TITLE: QUANTITATIVE RESEARCH AND DATA
ANALYSIS**

DATE: 28/04/2022

TIME: 0900-1200 HOURS

INSTRUCTIONS TO CANDIDATES

Answer **Question One** and Any Other **TWO (2)** Questions

TIME: 3 Hours

MMUST observes **ZERO** tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over. ►

QUESTION ONE

- a) Define the following concepts as used in educational statistics. (5 marks)
- A variable
 - Significance level
 - Bivariate analysis
 - Multivariate analysis
 - Quantitative data
- b) Explain how an educational student can use skills gained in educational statistics (6 marks)
- c) Explain how a researcher can uphold ethical standards in managing quantitative data (6 marks)
- d) Explain three roles of descriptive statistics in research. (3 marks)
- e) Explain three reasons why a researcher may opt to use a parametric test statistic (3 marks)
- f) A researcher is interested in the relationship of satisfaction of young adults before and after they go off to college/university which separates them from their sweat-heart. To be able to do this the researcher randomly sampled young adults who are about to be separated from their boy- or girl-friend by going to college. The researcher asks them to rate their satisfaction with the relationship with a relationship satisfaction rating of 0 - 50, and where a higher score indicates greater satisfaction. Then, after they have spent the first semester at colleges/universities (away from their sweat-heart), they again rate their relationship satisfaction. The results are presented as follows:

Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 before	39.0000	4	2.58199	1.29099
after	31.0000	4	.81650	.40825

Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 before & after	4	.632	.368

Paired Samples Test

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	before - after	8.00000	2.16025	1.08012	4.56257	11.43743	7.407	3	.005

- i) Justify the choice of the test statistic used (2 marks)
- ii) State the null hypothesis to be tested (1 mark)

iii) Using APA report the results of the test statistic

(4marks)

QUESTION TWO

- a) Explain three ways in which a researcher can gain by using a non-parametric test statistic. (3marks)
- b) A researcher believes that weights of poplar trees are different based on treatments (none treatment=no, fertilizer=fert, irrigation=irrig, or fertilizer and irrigation=f i). Each weight samples that determined by the treatments is independent and random, and each sample size is 5. But the weight samples are not normally distributed. The research question is to test whether the poplar tree weights are different under the four treatments.

Kruskal-Wallis test (Rank Sums) for variable weight classified by variable treat

treat	N	Sum of Scores	Expected Under H_0	Std. Dev Under H_0	Mean Score
no	5	45.00	52.50	11.443511	9.00
fert	5	37.50	52.50	11.443511	7.50
irrig	5	42.50	52.50	11.443511	8.50
f_i	5	85.00	52.50	11.443511	17.00

Average scores were used for ties.

Kruskal-Wallis Test

Chi-Square = 8.2329; DF=3; Pr > Chi-Square = 0.0414

- i) State the null hypothesis to be tested (2 marks)
- ii) Justify the choice of the test statistic by the researcher (3 marks)
- iii) Report the researchers findings in APA format (5 marks)
- iv) Based on the results, what recommendation would you make? (2 marks)

QUESTION THREE

- a) Differentiate between a categorical and numerical variable (2 marks)
- b) A random sample of 500 U.S. adults is questioned regarding their political affiliation and opinion on a tax reform bill. The results of this survey are summarized in the following contingency table:

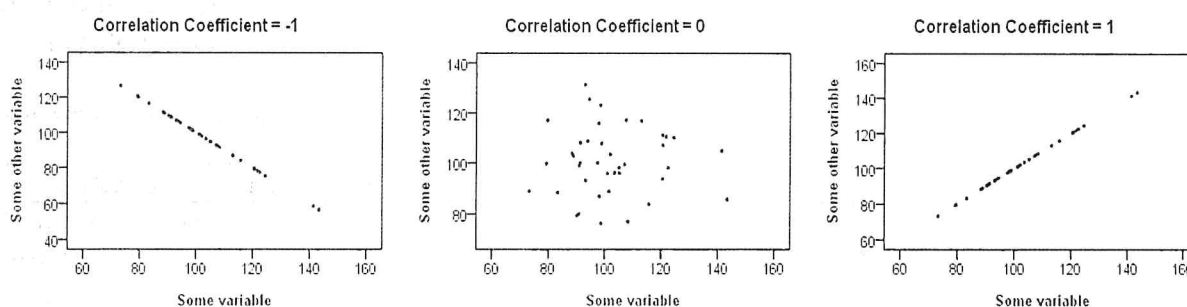
	Favor	Indifferent	Opposed	Total
Democrat	138	83	64	285
Republican	64	67	84	215
Total	202	150	148	500

- i) State the null hypothesis to be tested. (1 mark)
- ii) State any three assumptions of the use a chi-square. (2 marks)

- iii) Is the doctor ranking statistically significant? Report your findings in APA format (**Critical Chi-square =5.99**) (8 marks)
- iv) What recommendation can you deduce from the findings? (2 marks)

QUESTION FOUR

- a) Differentiate the concept statistical data and statistical method (2 marks)
- b) Explain the outputs of the correlations below (6 marks)



- c) The tables below show a Pearson’s product moment correlation matrix. Use it to answer the questions that follow.

Correlation matrix (Pearson):

Variables	Time spent on site	Invoice amount	Height	Weight
Time spent on site	1	-0,914	-0,781	-0,668
Invoice amount	-0,914	1	0,924	0,771
Height	-0,781	0,924	1	0,924
Weight	-0,668	0,771	0,924	1

Values in bold are different from 0 with a significance level alpha=0,05

p-values (Pearson):

Variables	Time spent on site	Invoice amount	Height	Weight
Time spent on site	0	< 0,0001	< 0,0001	< 0,0001
Invoice amount	< 0,0001	0	< 0,0001	< 0,0001
Height	< 0,0001	< 0,0001	0	< 0,0001
Weight	< 0,0001	< 0,0001	< 0,0001	0

- i) Give two assumptions for use of Pearson’s Product Moment Correlation (2 marks)
- ii) Report the researcher’s findings in APA format. (5 mark)