



# MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF EDUCATION

DEPARTMENT OF EDUCATIONAL MANAGEMENT AND CURRICULUM

STUDIES

FIRST YEAR FIRST SEMESTER EXAMINATION FOR

MASTER OF EDUCATION

ECC 802: EDUCATIONAL STATISTICS

DATE: 2/5/2019

TIME: 2:00 – 4:00 PM

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**INSTRUCTIONS:**

Answer question ONE and any other TWO questions. All questions carry equal marks.

**QUESTION ONE (20 MARKS)**

a) Using relevant examples, define the following terms; (10 marks)

- i) Kurtosis
- ii) Data
- iii) Skewness
- iv) Statistics
- v) Variable

b) Citing appropriate examples, distinguish between descriptive statistics and Inferential statistics. (6 marks)

c) Kuder-Richardson (K-R) 20 formula i.e  $KR_{20} = \frac{K(S^2 - \sum S_i^2)}{S^2(K-1)}$

Where;  $KR_{20}$  = Reliability coefficient of internal consistency

$K$  = Number of items used to measure the concept

$S^2$  = Variance of all scores

$S_i^2$  = Variance of individual items

Using the KR formula, briefly explain what a high coefficient implies (4 marks)

## QUESTION TWO (20 MARKS)

- a) In an examination done by 25 candidates, the mean was 60 marks and the standard deviation 8. Assuming it was a normal distribution:
- i) Compute the proportion of candidates who scored between 52 and 76 marks (2 marks)
  - ii) Supposing 85% of the top candidates are to be selected, what is the minimum mark a candidate is expected to score so as to be selected? (2 marks)
  - iii) How many students got 72 marks and above? (2 marks)
- b) The table shows the scores of students in an examination marked out of 50 marks

Marks	No. of Students
40 – 44	2
35 – 39	4
30 – 34	7
25 – 29	10
20 – 24	6
15 – 19	5
10 – 14	2
5 – 9	3
0 – 4	1
N = 40	

### Calculate

- i) The mean mark (4 marks)
  - ii) The mode (1 mark)
  - iii) The median (1 mark)
- c) State FOUR limitations of casual-comparative research and describe control procedures that can be used to minimize these limitations (8 marks)

## QUESTION THREE (20 MARKS)

- a) Give examples of studies in which it is appropriate to use the chi-square test and analysis of variance. In each case, give the reasons for your choice. (4 marks)
- b) Discuss the essential assumptions that are recognized when using regression analysis. (4 marks)

- c) Differentiate between simple and multiple regressions. (4 marks)
- d) Construct a regression model for a study set out to investigate the influence of age, education and occupation on financial status of households. (8 marks)

**QUESTION FOUR (20 MARKS)**

The scores of students in Mathematics is as given below;

Form (1A) 23, 60, 60, 45, 33, 48, 59, 75, 60, 13, 68

(1B) 11,25, 37, 80, 76, 37, 55, 26, 90, 79, 25, 37

- a) Calculate the standard deviation for each group, form 1A and form 1B (8 marks).
- b) Calculate the standard deviation for the combined groups -form IA and 1B (6 marks)
- c) Compute the t-test (6 marks)

**QUESTION FIVE (20 MARKS)**

- a) Explain why it is important to conduct normal distribution tests before analyzing data (4 marks)
- b) Assuming you have collected data on KCPE mean grades of primary schools in 4 counties. You wish to summarise the mean grades by county using a chart. Which is the most appropriate chart that can be used to perform the task?, justify your answer (4 marks)
- c) Differentiate between a one sample t-test and an independent sample t-test (2 marks)
- d) Interpret and explain the results of the hypothesis test contained in tables 2a and 2b (10 marks)

**Table 2a**

Group Statistics					
Scale	Gender	N	Mean	Std. Deviation	Std. Error Mean
Students motivation to learn physics	Male	44	4.0573	.43702	.06588
	Female	36	4.0189	.47439	.07907

**Table 2b**

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
ESMQ Pre-test mean scores	Equal variances assumed	.516	.475	.376	78	.708	.03838	.10207	-.16482	.24158
	Equal variances not assumed			.373	72.161	.710	.03838	.10292	-.16677	.24354