MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF EDUCATION

DEPARTMENT OF EDUCATIONAL COMMUNICATION AND TECHNOLOGY

FIRST YEAR FIRST SEMESTER EXAMINATION FOR

DOCTOR OF PHILOSOPHY EDUCATIONAL ADMINISTRATION/

EDUCATIONAL PSYCHOLOGY

ECC 901: ADVANCED EDUCATIONAL STATISTICS

DATE: 6/5/2019 **TIME: 2:00 – 5:00 PM**

INSTRUCTIONS:

Answer ALL questions in section A and TWO questions from section B.

SECTION A – Compulsory

QUESTION ONE (20 MARKS)

a) Explain the difference between reliability and validity. How would you make sure the data collected is valid and reliable? (10 marks)

b) Define random sampling, cluster sampling, stratified sampling, convenience sampling and purposive sampling (10 marks)

QUESTION TWO (15 MARKS)

A researcher was guided by the following objectives to undertake a study.

a) To explore the relationship between the professional qualification of the instructional supervisor and students' academic performance in KCSE in Machakos County.

b) To analyse the relationship between the experience of head teachers and students' academic performance in KCSE in Machakos County.

c) To establish the relationship between the supervisory practices used by the head teachers and students academic performance in KCSE in Machakos County.

Construct an appropriate data analysis matrix based on the above objectives.

SECTION B – ANSWER ANY TWO QUESTIONS
Note that the analysed data outputs were generated using SPSS

QUESTION THREE (15 MARKS)

a) Discuss FIVE reasons to justify why it is important for a researcher to plan for data analysis (5 marks)

b) The questionnaire given below was used by secondary school head teachers in Nakuru county to gather data on the economic status of parents of their students. Prepare a code book for the questionnaire (10 marks)

Questionnaire

i) Identification Number ……
ii) Gender Male ( ) Female ( )
iii) Number of dependants …….
iv) Main source of income ……
v) Estimated monthly income in Kenya Shilling …….
vi) How frequent do you save? Never ( ) Rarely ( ) Occasionally ( ) Often ( ) Very Often ( )

c) i) A masters student you are supervising intends to estimate the reliability of her instrument. The instrument is constructed using close-ended items. The responses to the items have been scored as follows; Wrong Answer-0 and Right Answer-1. Which method of estimating reliability would you recommend to her?, justify your answer. (2 marks)

ii) Interpret and explain the results of the reliability test in table 1 (3 marks)

Table 1

Reliability Statistics			
Cronbach's Alpha	Part 1	Value	1.000
		N of Items	1[a]
	Part 2	Value	1.000
		N of Items	1[b]
	Total N of Items		2
Correlation Between Forms			.695
Spearman-Brown Coefficient	Equal Length		.820
	Unequal Length		.820
Guttman Split-Half Coefficient			.817
a. The items are: odd			
b. The items are: even			

QUESTION FOUR (15 MARKS)

a) Explain why it is important to conduct normal distribution tests before analyzing data (4 marks)

b) A student you are supervising has collected data on KCPE mean grades of primary schools in 4 counties. She wishes 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

QUESTION FIVE (15 MARKS)

a) The head of the department has requested you to assist the student he is supervising interpret the results of her analyzed data. The results are in tables 3a, 3b and 3c. Interpret and explain the results of the test (12 marks)

Table 3a

Descriptive								
Students achievement in Kiswahili								
Group	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
E1	40	22.58	2.305	.365	21.84	23.31	16	25
E2	41	22.42	2.316	.362	21.69	23.15	17	26
C1	40	20.35	1.923	.304	19.74	20.97	16	23
C2	39	20.25	2.895	.464	19.31	21.19	13	23
Total	160	21.41	2.603	.206	21.01	21.82	13	26

Table 3b

ANOVA					
Students achievement in Kiswahili					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	193.121	3	64.374	11.354	.000
Within Groups	884.484	156	5.670		
Total	1077.605	159			

Table 3c

Multiple Comparisons						
Dependent Variable: Students achievement in Kiswahili Scheffe						
(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
E1	E2	.153	.529	.994	-1.34	1.65
	C1	2.220*	.532	.001	.72	3.72
	C2	2.323*	.536	.000	.81	3.84
E2	E1	-.153	.529	.994	-1.65	1.34
	C1	2.067*	.529	.002	.57	3.56
	C2	2.170*	.533	.001	.67	3.68
C1	E1	-2.220*	.532	.001	-3.72	-.72
	E2	-2.067*	.529	.002	-3.56	-.57
	C2	.103	.536	.998	-1.41	1.62
C2	E1	-2.323*	.536	.000	-3.84	-.81
	E2	-2.170*	.533	.001	-3.68	-.67
	C1	-.103	.536	.998	-1.62	1.41
*. The mean difference is significant at the 0.05 level.						

b). The results of a hypothesis test conducted by a church minister are in tables 4a, 4b and

c Interpret and explain the results of the hypothesis test (8 marks)

Table 4a

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Gender of the student * Believes in witchcraft	106	97.2%	3	2.8%	109	100.0%

Table 4b

Gender of the student * Believes in witchcraft Crosstabulation				
Count				
		Believes in witchcraft		Total
		yes	no	
Gender of the student	male	17	22	39
	female	47	20	67
Total		64	42	106

Table 4C

Chi-Square Tests					
	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.269[a]	1	0.007		
Continuity Correction[b]	6.201	1	0.013		
Likelihood Ratio	7.239	1	0.007		
Fisher's Exact Test				0.008	0.006
Linear-by-Linear Association	7.200	1	0.007		
N of Valid Cases	106				
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 15.45.					
b. Computed only for a 2x2 table					