THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

A. M. E. C. E. A

P.O. Box 62157

00200 Nairobi - KENYA

Telephone: 891601-6

MAIN EXAMINATION

JANUARY – APRIL 2019 TRIMESTER

FACULTY OF EDUCATION

DEPARTMENT OF POSTGRADUATE STUDIES IN EDUCATION

PART TIME PROGRAMME

ED 508: DATA PROCESSING AND COMPUTER APPLICATION

Date: APRIL 2019	**Duration: 3 Hours**
INSTRUCTIONS: Answer any FOUR Questions	

Q1. A researcher wants to find out whether the two categorical variables (Eating and Religion) are associated with each other – that is, are they dependent or independent? The chi square test is appropriate for this task.

Id	Eating	Religion
1	Meat Eater	No Religion
2	Vegetarian	No Religion
3	Vegetarian	Christian
4	Meat Eater	No Religion
5	Meat Eater	No Religion
6	Meat Eater	Christian
7	Vegetarian	Christian
8	Meat Eater	No Religion
9	Meat Eater	No Religion
10	Vegetarian	No Religion
11	Meat Eater	Christian
12	Meat Eater	Christian
13	Meat Eater	No Religion
14	Vegetarian	No Religion
15	Vegetarian	No Religion
16	Meat Eater	No Religion
17	Vegetarian	No Religion
18	Meat Eater	No Religion

19	Vegetarian	No Religion
20	Meat Eater	No Religion

a) Prepare and enter the given data set into SPSS **(3 Marks)**
b) State the appropriate Null and alternative hypothesis for this study **(4 Marks)**
c) Determine whether there is a relationship between Eating and Religion **(5 Marks)**
d) Use Chi-square to test whether there is a significant relationship between Eating and Religion at 0.05 level of significance. **(5.5 Marks)**

Q2. Everyone feels anxious and stressed out at times. This is normal behavior that often goes hand-in-hand with a busy life. A study was conducted to establish whether there was a relationship between a measured anxiety score of a parent and the anxiety score of a child. The following data was obtained:

Anxiety score of a Parent	Anxiety score of a Child
5	3
8	7
7	9
2	4
9	6
3	2
7	8
4	6
8	9
1	3
5	5
3	3
2	2
4	4
3	3
2	2
4	4

a) Prepare and enter the given data set into SPSS **(3 Marks)**
e) State the appropriate Null and alternative hypothesis for this study. **(4 Marks)**
b) Determine whether there is a relationship between the anxiety scores of parents and children **(5 Marks)**
c) Is there a significant relationship between the anxiety scores of parents and children at 0.05 level of significance? Support your answer. **(5.5 Marks).**

Q3. A researcher collected data from a sample of 25 Respondents regarding the following variables:

Var1: Respondent's identification number (ID)
Var2: Province the respondents lives in (PROVINCE)
1 = Alberta
2 = British Columbia
Var3: Respondent's gender (GENDER)
1 = Male
2 = female
Var4: Respondent's ethnicity (ETHNICITY)
1 = Caucasian
2 = Black
Var5: Respondent's age (AGE)
Var6: Respondent's religious affiliation (RELIGION)
1= Protestant
2= Catholic
3= Jewish
Var7: Respondent's mother's education - years of schooling (MAEDUC)

DATA SET

ID	PROVINCE	GENDER	ETHNICITY	AGE	RELIGION	MAEDUC
1	British Columbia	Male	Caucasian	32	Protestant	16
2	British Columbia	Female	Caucasian	37	Catholic	13
3	British Columbia	Female	Black	72	Catholic	20
4	British Columbia	Female	Caucasian	86	Jewish	12
5	British Columbia	Male	Caucasian	30	Protestant	5
6	British Columbia	Male	Caucasian	32	Catholic	10
7	British Columbia	Male	Black	29	Protestant	18
8	British Columbia	Female	Black	29	Protestant	4
9	British Columbia	Female	Black	53	Protestant	6
10	British Columbia	Male	Black	68	Protestant	9
11	British Columbia	Male	Caucasian	19	Catholic	2
12	British Columbia	Male	Black	43	Catholic	14
13	Alberta	Female	Black	38	Jewish	12
14	Alberta	Female	Caucasian	45	Catholic	17
15	Alberta	Female	Black	24	Jewish	1
16	Alberta	Female	Caucasian	53	Catholic	3
17	Alberta	Male	Caucasian	20	Catholic	7
18	Alberta	Male	Caucasian	27	Catholic	11
19	Alberta	Male	Caucasian	54	Catholic	8
20	Alberta	Female	Black	25	Protestant	15
21	Alberta	Female	Black	20	Catholic	1
22	Alberta	Female	Black	38	Catholic	7
23	Alberta	Male	Caucasian	20	Catholic	5

24	Alberta	Female	Black	34	Catholic	10
25	Alberta	Female	Caucasian	67	Protestant	19

a) Prepare and Enter all the data set given into SPSS **(5 Marks)**

b) Run the appropriate descriptive statistics to summarize the following variables and comment on the results:
   i) Province, Gender, Ethnicity and Religion
   ii) Age and MAEDUC **(2.5 Marks)**

c) Establish the relationships of the following variables and comment on the results you obtain:
   i) Gender and Ethnicity
   ii) Ethnicity and Religion
   iii) Gender and Religion
   iv) Age and MAEDU **(4 Marks)**

d) Determine whether there is a significant relationship between (at 5% significance level):
   a) Ethnicity and Religion
   b) Age and MAEDU
   c) Gender and Religion **(6 Marks)**

Q4. a) Explain in details the main characteristics of the four types of measurement levels (Nominal, Ordinal, Interval and Ratio) of quantitative data**. (3Marks)**

b) Differentiate the following terms:
   a) Population and Sample
   b) Descriptive and inferential statistics
   c) Null and Alternative Hypothesis **(3 Marks)**

c) A Chi-square test was conducted to establish whether there is a significant relationship between gender and year at 5% level of significance and obtained the following results:

Year of study * Gender

	Gender	Total

			Female	Male	
Year of study	First	Count	4	1	5
		Expected Count	2.3	2.7	5.0
	Second	Count	2	3	5
		Expected Count	2.3	2.7	5.0
	Third	Count	1	4	5
		Expected Count	2.3	2.7	5.0
Total		Count	7	8	15
		Expected Count	7.0	8.0	15.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.750[a]	2	.153
Likelihood Ratio	3.990	2	.136
N of Valid Cases	15		

a. 6 cells (100.0%) have expected count less than 5. The minimum expected count is 2.33.

Based on the results obtained above, what would be the right conclusion for the researcher to make? **(3 Marks)**

d) The following table shows the results of a statistical test done by a researcher:

		Weight
Height	Pearson correlation	0.776
	Sig.(2. tailed)	0.000
	N	12

i) Write a suitable research question that the researcher attempted to answer. **(Marks 2)**

ii) State a suitable null and alternative hypothesis the researcher would test**.** **(Marks 3)**

iii) Determine whether there is a significant relation between the height and the weight of a person based on the results shown in the table, given alpha value of 0.05. **(Marks 3.5)**

Q5. a) A researcher measures how long it takes students to complete an exam. He calculates the mode, median and mean of the data and finds that the

mode is less than the median which is less than the mean. Briefly explain the true distribution of scores. **(2 Marks)**

b) A study tested whether the consumption of alcohol slows reaction time. One group of randomly selected participants drank a placebo that tasted like, but did not contain alcohol, while another group drank just enough alcohol, given their body weight, to become legally drunk. After waiting a sufficient amount of time for the effects of the alcohol to occur, both groups pressed a button as soon as they could whenever a light turned on. How long it took the participants to press the button was recorded. All participants had normal vision. What is the dependent variable in this study? **(2 Marks)**

c) A coffee shop wants to know the temperature of coffee that most people prefer. They brew coffee at the typical temperature for the shop and then ask customers "Do you prefer coffee to be at this temperature?" and record a yes or no answer for each customer. What is the level of measurement of the way they measured preferred temperature? **(2 Marks)**

d) The same coffee shop later repeats the study but this time they ask "Do you prefer coffee to be a lot colder, a little cooler, this temperature, a little warmer or a lot hotter?" and record the person's response. Now, what is the level of measurement of the way they measured preferred temperature? **(2 Marks)**

e) Finally, the same coffee shop repeats the study but this time they brew the coffee at seven different temperatures, each one being exactly 5° C warmer than the previous cup. They have each customer sample all seven cups and indicate the cup that they think is at the perfect temperature. Now, what is the level of measurement of the way they measured preferred temperature? **(2 Marks)**

f) What is the difference between correlation and regression analyses? Give examples of how each of them can be applied in an educational setup. **(7.5 Marks)**

END