MACHAKOS UNIVERSITY

University Examinations for 2018/2019 Academic Year

SCHOOL OF EDUCATION

DEPARTMENT OF EDUCATIONAL MANAGEMENT AND CURRICULUM STUDIES

APRIL SESSION EXAMINATION FOR DOCTOR OF PHILOSOPHY

EDUCATIONAL ADMINISTRATION/ EDUCATIONAL PSYCHOLOGY

ECC 901: ADVANCED STATISTICS IN EDUCATION.

DATE: 8/8/2019   **TIME: 8.30-11.30 AM**

INSTRUCTIONS:
Answer QUESTION ONE and any other TWO QUESTIONS

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QUESTION ONE

In the regression equation

$y = a + bx$

$$b = \frac{\sum xy - {}^{1}/_{n}(\sum x)(\sum y)}{\sum x^2 - {}^{1}/_{n}(\sum x)^2}$$

And $\neg a = y = bx$

Explain the symbols $\sum xy$, $\sum x$, $\sum y$, $\sum x2$, $(\sum x)2$

Given:

X	y
2	3
4	5
5	6
6	8
12	14
15	18

Determine the regression line   (15 marks)

QUESTION TWO

$$x^2 = \sum \frac{(0-E)^2}{E} \qquad \sum = \frac{RiCi}{N}$$

Explain the symbols   0, E $(0-E)^2$, Ri and Ci

Given

	Pass	Fail	
Boys	35	15	50
Girls	20	30	50
	55	45	100

Complete the table below   (8 marks)

0	E	$(0-E)$	$(0-E)^2$	
35				
15				
30				
20				

How significant is the x^2 value at $\alpha = 0.05$?   (3 marks)

$\emptyset = \sqrt{\frac{x^2}{N}}$ comment on the value of $\emptyset$ (4 marks)

QUESTION THREE

In the marri Whitney U-test

$$u_1 = n_1 n_2 + \frac{n_1 + (n_1 + 1)}{2} - r_1$$

$$u_2 = n_1 n_2 + \frac{n_2 + (n_2 + 1)}{2} - r_2$$

$$z = \frac{u - (n_1 + n_2 + 1)}{z} \Big/ \sqrt{\frac{n_1 n_2 (n_1 + n_2 + 1)}{12}}$$

a)   Explain the meaning of $n_1 n_2 r_1 r_2 u_1 z_1$ (8 marks)

b)   Given two samples

   Sample 1 43 31 50 53 66 68

   Sample 2 6 10 13 14 29 42 50

   Compute

   i. U_1 (4 marks)

   ii. U_2 (4 marks)

   iii. Z (4 marks)

QUESTION FOUR

Complete the frequency table below   (9 marks)

X	F	FX	X^2	FX^2		
5	5					
15	8					
25	15					
35	20					
45	40					
55	40					
65	20					
75	15					
85	8					
95	5					

Find   i) $\sum fx$ (1 mark)

       ii) $\sum fx^2$ (1 mark)

       iii) var= $\dfrac{\sum fx^2 - \dfrac{\left(\sum fx\right)^2}{n}}{n-1}$ (5 marks)

   iv) The standard deviation.   (4 marks)

QUESTION FIVE

The kruskal – wallis – H test is calculated using the expression:

$$H = \frac{12}{n(n+1)} \sum \frac{r_i^2}{n_i} - 3(n+1)$$

a) Explain the symbols n n_i R_i^2 and $\sum_{i=1}^{n} \frac{R_i^2}{n_i}$ (6 marks)

b) Work out the kruskal – wallis h- statistic for the data below (8 marks)

   G1: 271 282 257 248 262

   G2: 252 275 302 268 276

   G3: 260 255 239 246 266

   G4: 279 242 297 270 158

c) Interpret the value you have calculated (6 marks)