

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN NURSING

NURS 393: BIOSTATISTICS

STREAMS: BSC NURS Y3S2

TIME: 2 HOURS

DAY/DATE: THURSDAY 06/12/2018

11.30 A.M – 1.30 P.M

INSTRUCTIONS

- **Answer all questions in section 1 and two questions in section II**
- **Use of calculators and statistical tables is allowed**
- **Do not write anything on the question paper**

SECTION 1

1. Differentiate between the following terms; [14 marks]
 - (a) Primary data and secondary data
 - (b) Population and sample
 - (c) Parameter and statistics
 - (d) Point estimate and interval estimate
 - (e) Treatment and factor as used in experimental designs
 - (f) Parametric and non parametric test
 - (g) Type 1 error and type II error
2. Distinguish between cluster and stratified random sampling. [4 marks]
3. An epidemiologist determine the frequency of cancer among members of 600 families of size five. If the probability of cancer is 0.12 and this is a random event, predict the number of families,
 - (a) With exactly one case of cancer? [3 marks]
 - (b) With one or more cases of cancer? [3 marks]

4. (a) In an outbreak of cholera in two adjacent estates (A and B) in 2017, 38 of 1057 individuals residing on estate A had cholera, compared with 14 of 1037 individuals residing in estate B. Calculate the risk ratio. [3 marks]
- (b) Using the following data calculate the vaccine effectiveness from the measles. [3 marks]

	Measles	Non –case
Vaccinated	22	136
Unvaccinated	5	6

SECTION II (40 MARKS)

5. Using the following data set, calculate the mean, mode, median, standard deviation, coefficient of variation and Pearson measure of skewness of successive sale of medication by agiven firm. [20 marks]

Number of sales	0-7	8-15	16-23	24-31	32-39	40-47
Number of salesmen	3	17	39	55	42	27

6. Four doctors each test five treatment for a certain disease and observe the number of days each patient takes to recover. The results (recovery time in days) are given below

Doctors/treatment	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5
Doctor 1	20	28	26	36	40
Doctor 2	22	30	28	34	42
Doctor 3	18	24	40	32	38
Doctor 4	16	26	34	34	40

Perform analyze of variance and test an appropriate hypothesis. Take $\alpha = 0.05$. [20 marks]

7. (a) The following data are measurements of the heparin cofactor II (HCII) to plasma protein ratios in a group of patients at baseline and five months after haemodialysis.

Patient	1	2	3	4	5	6	7	8
Before	2.13	1.87	1.85	1.77	1.56	1.54	1.51	1.46
After	2.17	2.13	1.95	1.85	1.92	1.58	1.46	1.45

Using an appropriate non parametric procedure, test an appropriate hypothesis. Take $\alpha = 0.05$. [7 marks]

(b) Using the following data fit a regression model. [7 marks]

X	1	2	3	4	5	6	7
Y	4	11	14	24	32	38	44

(c) It is claimed by the traffic police department that accidents in Kenyan roads are equally influenced by drunk driving, speeding, jumping traffic lights, talking on cell phone and mechanical breakdown of the vehicle. A random sample of 100 reports indicate the following results.

Type of fault	Number of accidents
Drunk driving	28
Speeding	24
Jumping lights	19
Talking on cell phone	16
Mechanical breakdown	13

Does the observed information agree with the expected ratios at 5% significance level?

[6 marks]