



MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS

2017/2018 ACADEMIC YEAR

THIRD YEAR END OF FIRST SEMESTER

EXAMINATIONS

SCHOOL OF SCIENCE AND INFORMATION SCIENCES

FOR

**THE DEGREE OF BACHELOR OF EDUCATION (SCIENCE) AND BACHELOR
OF SCIENCE**

ZOO 322E/BOT 322: BIOSTATISTICS

DATE: 23RD APRIL 2018

TIME: 8.30A.M-10.30AM

INSTRUCTIONS TO CANDIDATES

1. Answer all the questions in section A and any other two questions from section B.
2. Illustrate your answers with suitable diagrams and give examples wherever necessary.

This paper consists of 3 printed pages. Please turn over.

SECTION A: Answer ALL the questions (30 marks)

1. Explain the meaning of the following variables **(3 marks)**
a) Independent variable b) Dependent variable c) Nominal variable
2. We wish to determine the required sample size with 95% confidence and 5% error tolerance that the percentage of citizens preferring the Party A. A recent poll showed that 40% of Citizens questioned preferred party B. What is the required sample size? **(3 marks)**
3. Outline the characteristics of the mean as a measure of central tendency (3 marks)
4. Use the following data to calculate the median: 6.1, 0.6, 1.2, 3.3, 2.9, 3.6, 1.9, 1.5, 2.8, 2.5, 2.3, 2.1, 3.7, 3.8, 3.9, 2.3, 4.1, 4.2, 4.5, 4.7, 4.9, 5.3, 5.6, 3.4, **(3 marks)**
5. Outline the assumptions to take when using Chi square **(3 marks)**
6. Describe the disadvantages of using non-parametric methods **(3 marks)**
7. Interpret the meaning of the following values of Pearson's correlation coefficient.
a) When $r=+1$ b) When $r=-1$ c) when $r=0$ **(3 marks)**
8. Outline the important properties of the student t-distribution **(3 marks)**
9. What's the probability that you flip exactly 3 heads in 5 coin tosses? **(3 marks)**
10. If calls to your cell phone are a Poisson process with a constant rate $\lambda=2$ calls per hour, what's the probability that, if you forget to turn your phone off in a 1.5 hour meeting, your phone rings during that time? **(3 marks)**

SECTION B: Answer any 2 questions

11. The following data shows the results of repeated (paired) observations of diagnostic blood pressure of a group of patients before and after treatment with drug A.

Before (DBP)	145	160	150	140	175	130	128	155	157	170
After (DBP)	125	165	115	146	180	120	137	130	165	145

Test the hypothesis that the drug A is effective in reducing diagnostic blood pressure using the student t-test. Note: $p=0.05$ $t_{(a)}=2.26$ **(20 marks)**

12. The following data shows the results of test two random samples of patients weights in kgs.

Group I	62	70	65	57	60	66	59	68
Group II	72	60	58	67	67	56	69	64

Test the hypothesis that the two groups of patients differ in weight using the mann-

whitney U-statistic. (Note: $U = \min(U_1, U_2)$; $U = n_1 n_2 + \frac{n_1 + 1 \cdot n_2}{2} - \Sigma R1$) (Note U=10 for

$n_1 = 7, n_2 = 8, p = 0.05$) Interpret your results **(20 marks)**

13. Use the following data to compute r, slope, intercept, regression. What is this equation used for? **(20 marks)**

X	1	2	3	4	5	10	15	18	20	30
Y	34	36	37	39	41	50	59	64	68	86

14. Children of three ages are asked to indicate their preference for three photographs of adults. Do the data suggest that there is a significant relationship between age and photograph preference? What is wrong with this study? [Chi-Square = 29.6, with 4 d.f.: $p < 0.05$]. **(20 marks)**

Photograph:

	A	B	C
Age of child: 5-6 years:	18	22	20
7-8 years:	2	28	40
9-10 years:	20	10	40

END//