JARAMOGI OGIGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF HEALTH SCIENCES
MASTERS IN PUBLIC HEALTH EXAMINATION

<u>**KISUMU CAMPUS**</u>

END SEMESTER EXAMINATION
<u>**HMP 5114: BIOSTATISTICS**</u>

<u>**December 2018**</u>

TIME ALLOWED: 3 hours

Note: Answer question one and any other three questions

QUESTION 1 (COMPULSORY)

QUESTION 1

a. Name two main types of probability distribution (**2 Marks**)
b. Differentiate between Ch-square and analysis of variance (**2 Marks**)
c. List three (3) examples of measures of dispersion (**3 Marks**)
d. As part of diarrhoeal morbidity survey, a random sample of 30 houses in a large village was visited and 7 of them had a latrine.

i.   What proportion of the houses have latrine (**1 Mark**)
ii.   Calculate standard error (**2 Marks**)

iii.   Calculate the 99% confidence interval (**3 Marks**)

iv.   Interpret the results obtained in (iii) above (**2 Marks**)

QUESTION 2

e. List two reasons why summary measures and graphical presentation of the data is important at the beginning of data analysis (**3 Marks**)
f. Sketch a graph showing symmetric distribution about the mean value (**3 Marks**)
g. State two (2) examples of skewed data (**2 Marks**)
h. List three (3) approaches of transforming skewed variable (**3 Marks**)
i. Name four (4) properties of a normal curve (**4 Marks**)

QUESTION 3

a. Define joint probability (**2 Marks**)
b. Differentiate between simple and compound events in probability giving one example in each case (**3 Marks**)
c. If the success rate of a medical surgery is known to be 70%. If 50 patients are to undergo the same surgery, what is the probability that:

i.   None will survive (**2 Marks**)

ii.   Only 50% of the patients will survive (**3 Marks**)

iii.   At least two patients will survive (**3 Marks**)

iv.   Calculate the mean and standard deviation (**2 Marks**)

QUESTION 4

a) The frequency distribution of patients aged between 10 to 49 years who visited a health centre in Kisumu county in the month of April, 2014 is shown in table below

Age group	Frequency of patients
10-14	5
15-19	6
20-24	7
25-29	10
30-34	5
35-39	3
40-44	4
45-49	8

    i.   Present this data using a appropriate graph (**3 Marks**)

    ii.   What is the width of the intervals (**2 Marks**)

    iii.   Calculate the mean, median, mode and standard deviation (**10 Marks**)

QUESTION 5

a. Define confidence interval   (**2 Marks**)

b. List three (3) examples of non-parametric tests (**3 Marks**)

c. A total of 36 hypertensive individuals were split into two groups of 18. Group 1 received a diuretic therapy while Group 2 received a diuretic therapy in combination with other antihypertensive agents. After one month, their diastolic blood pressures were measured and results summarized as follows: Group 1 had a mean of 117.0 mm/Hg with a standard deviation of 22, while group 2 had a mean of 93.0 mm/Hg, with a standard deviation of 20.

    i.   State the alternative hypothesis (**1 Mark**)

    ii.   Test if there is any significant effect of therapy (**7 Marks**)

    iii.   Interpret results obtained in (ii) above (**2 Marks**)

QUESTION 6

a. When do we use Chi-square test during analysis (**2 Marks**)

b. Name two sources of variation in experimental units (**2 Marks**)

c. An experiment in which the reaction times of rats responding to a stimulus are compared using three different drug treatments. The reaction times obtained (in hundredths of a second) are given below.

Rat Number:	1	2	3	4	5	6
Drug A	12	10	14	15	18	21
Drug B	17	14	17	13	23	24
Drug C	26	21	28	29	31	35

    i.   State the null hypothesis   (**1 Marks**)

    ii.   Construct analysis of variance table (**8 Marks**)

    iii.   Is there significant effect of three drugs on reaction time of rats to a stimulus (**2 Marks**)