



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR SCIENCE IN
PUBLIC HEALTH AND COMMUNITY HEALTH DEVELOPMENT.
4TH YEAR 2ND SEMESTER 2016/2017 ACADEMIC YEAR
KISII CAMPUS – PART TIME**

COURSE CODE: SBI 3415

COURSE TITLE: BIOSTATISTICS II

EXAM VENUE: LR 17

STREAM: (BSc. P. Health / Comm Hlth & Dev)

DATE: 19/12/16

EXAM SESSION: 9.00 – 11.00 AM

TIME: 2 HOURS

Instructions:

- 1. Answer Question ONE (COMPULSORY) and ANY other 2 questions**
- 2. Candidates are advised not to write on the question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

QUESTION ONE

- a) Define the following terms. (3 marks)
 - i. Data.
 - ii. Statistic.
 - iii. Parameter.
- b) Giving examples differentiate between independent and dependent variables. (3 marks).
- c) Qualitative variable and Quantitative variable. (3 marks).
- d) Define the following terms as used in inferential statistics. (3 marks).
 - i. P-value.
 - ii. Confidence interval.
 - iii. Standard error.
- e) Giving examples differentiate between null hypothesis and alternative hypothesis. (3 marks).
- f) Describe three Properties of a Good Estimator. (3 marks).
- g) A researcher wishes to estimate the number of days it takes a medical equipment dealer to sell a blood pressure machine. A sample of 50 blood pressure machine had a mean time on the dealer's store of 54 days. Assume the population standard deviation to be 6.0 days. Find the best point estimate of the population mean and the 95% confidence interval of the population mean. $z = 1.96$. (3 marks).
- h) Describe the characteristics of the t Distribution. (3 marks).
- i) Briefly discuss data transformation. (3 marks).
- j) Describe sources of variation in an experiment. (3 marks).

QUESTION TWO

3. The following data was obtained from a statistics class in a study on the number of absences and the final grades of seven randomly selected students.

Student	Number of absences x	Final grade y (%)
A	6	82
B	2	86
C	15	43
D	9	74
E	12	58
F	5	90
G	8	78

- a) Describe Correlation Coefficient and its application. (5 marks).
- b) Construct a scatter plot for the data. (3 marks)

- c) Compute the correlation coefficient for the data and interpret.(6mks)
- d) Find the equation of the regression line for the data. (6mks).

QUESTION THREE

- a) Describe the Properties and Uses of the following measure Central Tendency.(10 marks)
 - i. Mean.
 - ii. Median.
 - iii. Mode.
 - iv. Mid range.
- b) The following data represent weights of 16 patients.

56	60	65	66	68	65	72	73
61	57	72	61	71	60	72	74

Calculate

- i. Mean.(2 marks)
- ii. Median.(2 marks)
- iii. Variance.(4 marks)
- iv. Standard deviation .(2 marks)

QUESTION FOUR

- a) Describe the following terms as used in hypothesis testing.(6 marks)
 - i. A statistical test.
 - ii. A type I error.
 - iii. A type II error.
- b) Outline the steps followed in hypothesis testing.(4 marks).
- c) A medical investigation claims that the average number of infections per week at a hospital in southwestern Pennsylvania is 16.3. A random sample of 10 weeks had a mean number of 17.7 infections. The sample standard deviation is 1.8. Is there enough evidence to reject the investigator's claim at a $\alpha = 0.05$? **NB The critical values are +2.262 and - 2.262 for a $\alpha=0.05$ and d.f. 9. (10 marks).**

QUESTION FIVE

- a) Explain the following terms as used in biostatistics.(8 marks)
 - i. Point estimate.
 - ii. Interval estimate.
 - iii. Confidence level.
 - iv. Maximum error of the estimate.
- b) State the advantages and disadvantages of Nonparametric Methods.(6 marks).
- c) State the assumptions for the F Test for comparing three or more means.(3 marks).
- d) State the assumptions for multiple regression.(3 marks).