

**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2012/2013**

**FIRST YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF MASTER OF PUBLIC HEALTH**

**(KISII LEARNING CENTRE)**

COURSE CODE: HMP 5114

COURSE TITLE: BIOSTATISTICS

DATE: 16/4/2013 TIME: 8.00-11.00AM

DURATION: 3 HOURS

INSTRUCTIONS

1. This paper contains FIVE (5) questions
2. Answer question 1 (Compulsory) and ANY other 3 Questions
3. Write all answers in the booklet provided

**QUESTION 1 (COMPULSORY)**

1. State three main ways of summarizing categorical data (**3 Mark**)
2. List three (3) examples of parametric test **(3 Marks)**
3. Distinguish between:
4. variable and value **(2 Marks)**
5. discrete and continuous probability **(2 Marks)**
6. Type I error and type II error **(2 Marks)**
7. Arithmetic mean and median **(2 Marks)**

1. Define Chi-square test **(1 marks)**

**QUESTION 2**

1. Distinguish between measures of central tendency and measures of variation giving two examples in each case (**7 Marks**)
2. Define standard error (**2 Marks**)
3. In a population of 7-years old primary school children from Nyanza, 5% of them possess the sickle trait. What is:
4. The standard error of the proportion of sickle cell patients in repeated sample of 200 from this population? (**3 Marks**)
5. The 95% confidence interval? (**3 Marks**)

 **QUESTION 3**

1. State three (3) approaches for defining probability (**3 Marks)**
2. Outline the procedure for testing hypothesis (**6 Marks)**
3. If a couple have two children.
4. List the possible ways the sex of the children can occur (**2Marks** )
5. What is the probability of the couple having exactly 2 boys (**2 Marks**)
6. What is the probability of the couple having at least a girl (**2 Marks**)

 **QUESTION 4**

1. Outline the difference between categorical and numeric variables (**4 Marks**)
2. State two ways of assessing normality assumption in a data (**3 Marks**)
3. Cystic fibrosis is an inherited condition controlled by the action of a single recessive gene, c. Sufferers have homozygous genotype cc. for an offspring to be at risk - both parents must be carriers - heterozygous, genotype Cc. Of 86 children, 25 were normal, 45 carriers and 16 affected. Is there any deviation from the Mendellian Theory that says 25%, 50% and 25% are normal, carriers and affected in any population? **(8 Marks)**

**QUESTION 5**

1. List three (3) factors determining the choice of test statistics (**3 Marks**)
2. State four (4) assumption of normal distribution (**4 Marks**)
3. Sketch the following curves:
4. Normal curve **(2 marks)**
5. Positively skewed curve **(2 marks)**
6. Negatively skewed curve **(2 marks)**
7. Define confidence interval **(2 Marks)**

**QUESTION 6**

1. List three (3) ways of presenting a normal probability distribution (**3 Marks**)
2. In a study of the impact of smoking on general cardiovascular fitness, six non-smokers, six light smokers, six moderate smokers, and six heavy smokers were subjected to a period of sustained physical exercise. After three minutes rest their heart rates were measured. The results are as presented below:

Non smokers Light smokers Moderate smokers Heavy smoker

 69 55 67 92

1. 60 77 73
2. 78 81 87
3. 58 70 68
4. 62 57 96

 65 66 79 85

1. State the null hypothesis (**2 Marks)**
2. Construct analysis of variance table **(8 Marks)**
3. Given that the F-distribution table, the tabulated value at 5% at (3, 20) degrees of freedom is 3.10. Is there significant effect of level of smoking on the heart rate **(2 Marks)**