BONDO UNIVERSITY COLLEGE
UNIVERSITY EXAMINATIONS 2012/2013
FIRST YEAR FIRST SEMESTER EXAMINATIONS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH

KISII LEARNING CENTRE

COURSE CODE: HMP 5114
TITLE: BIOSTATISTICS
DATE: 13/12/2012 TIME: 8.00-11.00AM
DURATION: 3 HOURS

INSTRUCTIONS

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

QUESTION 1 (COMPULSORY)

a) What is probability (**1 Mark**)
b) List three (3) examples of discrete probability distribution **(3 Marks)**
c) Distinguish between
   i. bar graph and histogram **(2 Marks)**
   ii. discrete and continuous variables **(2 Marks)**
   iii. parametric and non parametric test of significance **(2 Marks)**
   iv. median and mode **(2 Marks)**

d) State three methods of data transformation **(3 marks)**

QUESTION 2

a) List two types of data (**2 Marks**)

b) The following are the age (years) at onset of a chronic disease recorded in 50 patients in Kisumu district hospital in 2011:

54	45	58	49	47	50	55	40	46	41
46	44	55	58	49	53	49	45	42	49
52	51	47	58	41	45	53	53	47	51
46	48	52	56	47	48	44	55	57	54
42	58	49	53	52	54	59	42	58	44

   i. Present this data in an appropriate frequency table (**6 Marks**)
   ii. Calculate the mean, median, mode and standard deviation (**7 Marks**)

QUESTION 3

a) State six (4) properties of the standard normal distribution **(4 marks)**

b) Briefly outline the difference between experiment and trail in probability concept **(3 Marks)**

c) In the sexually transmitted diseases clinic in Kisumu district hospital, Kisumu County, 20 girls were found to be infected with either gonorrhea or Chlamydia trachonomatis or both. If 8 girls had Chlamydia trachonomatis, 8 girls gonorrhea and 4 girls with both infections. Find the probability of the:
   i) Girl having Chlamydia trachonomatis **(4 marks)**
   ii) Girl having Chlamydia trachonomatis or gonorrhea **(4 marks)**

QUESTION 4

a) Name two assumptions of central limit theorem **(2 Marks)**

b) State whether the following are discrete or continuous variables.

i) Blood pressure readings of a patient **(1 Mark)**

ii) Number of files in a cabinet **(1 Mark)**

iii) Annual income of a diabetic patients **(1 Mark)**

iv) IgG values of 20 new born babies **(1 Mark)**

v) Number of postgraduate students in this university **(1Mark)**

c) A Chemical Pathologist obtained cholesterol levels from 200 serum cord blood samples and calculated the mean as 1.31mmoL/L with a standard deviation of 0.36mmoL/L, if we assume sample means of cholesterol levels follow a normal distribution:

i. Calculate the 95% confidence interval of cholesterol level **(3 Marks)**

ii. Interpret the result obtained above **(2 Marks)**

d) List three examples of non parametric test of significance **(3 Marks)**

QUESTION 5

a) State two ways of presenting qualitative data **(2 Marks)**

b) List three properties of standard normal curve **(3 Marks)**

c) Name three factors affecting the choice of test statistics (**3Marks)**

d) The mean time taken in days to regain lost weight by 20 children fed on the standard formula premium is 13.1 days with a standard deviation of 5.3 days. Another comparable group of 20 children fed on prematalac milk had a mean of 9.9 days and a standard deviation of 3.7 days to regain their lost weight.

i. Is there a significance difference in the number of days to regain lost weight as a result of the different types of milk consumed (**5 marks)**

ii. Comment on your findings **(2 Marks)**

QUESTION 6

a) Define statistical hypothesis **(2 Marks)**

b) The number of seconds it took 20 patients randomly allocated to 4 treatment groups to fall asleep following the administration of different dose levels of a new tranquillizer is given in the table below.

Number of seconds per patient

0.5mg	**1.0mg**	**1.5mg**	**2.0mg**
22	25	26	26
26	27	29	28
25	28	33	27
25	26	30	30
31	29	33	30

i) State the null hypothesis **(2 Marks)**
ii) Construct analysis of variance table **(8 Marks)**
iii) Given that the F-distribution table, the tabulated value at 5% at 3, 16 degrees of freedom is 3.24. Is there significant effect of the dosage on the time it took patients to fall asleep **(3 Marks)**