JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF HEALTH SCIENCES
UNIVERSITY EXAMINATION FOR DIPLOMA IN COMMUNITY HEALTH AND DEVELOPMENT
2ND YEAR 2ND SEMESTER 2017/2018 ACADEMIC YEAR
KISUMU LEARNING CENTRE

COURSE CODE:	**HDC 2223**
COURSE TITLE:	**INTRODUCTION TO BIOSTATISTICS**
EXAM VENUE:	**KISUMU LEARNING CENTRE**
DATE:	**EXAMINATION SESSION: 9-11 AM**
TIME:	**2 HOURS**

Instructions:

1. **Answer all the questions in Section A and ANY other 2 questions in Section B.**
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.**

Answer all questions (30 Marks)

1. Define the following terms: (2 Marks)
   (i) Statistic
   (ii) Parameter
   (iii) Histogram
   (iv) Probability

2. Identify the population, sample, and the variable of interest in each of the following cases. Also, mention whether the variable is qualitative or quantitative. If the variable is quantitative, state whether it is discrete or continuous.   (5 Marks)
   (a) A business executive hypothesizes that the average annual income of her customers is $40,000. To test her hypothesis, she selects 32 of her customers at random and determines the annual income of each.
   (b) 64 UNG students were selected at random and asked if they wanted more parking on campus.

3. A family has 5 children. Show that the probability of getting 0 boys, 1 boy, 2 boys, 3 boys, 4 boys or 5 boys is 1.   (3 Marks)

4. A married couple has 4 children. P(Boy) = 0.479 What is the Probability of them having 3 boys and 1 girl?   (2 Marks)

5. Suppose that a manufactured product has 2 defects per unit of product inspected. Using Poisson distribution, calculate the probabilities of finding a product without any defect, 3 defects and 4 defects.   (2 Marks)

6. Calculate the mean, variance, the standard deviation, SEM and the coefficient of variation of the data below:
   7, 8, 1, 1, 9, 19, 11, 2, 3, 4, 8   (12 Marks)

7. State TWO merits that mean has over median as a measure of average   (2 Marks)
8. State TWO methods of data presentation   (2 Marks)

SECTION B
Answer any two Questions (30 Marks)

Question 7. The following is a hypertension levels data collected from a given population of individuals.

Group	*Fi*
9.1-10.0	13
10.1-11.0	29
11.1-12.0	76
12.1-13.0	289
13.1-14.0	84
14.1-15.0	29
15.1-16.0	40

Determine the following;

        (a) Mean   (4 Marks)

        (b) Standard error   (4 Marks)

        (c) Standard deviation   (8 Marks)

        (d) Median   (4 Marks)

Question 8. John conducted a study to assess physician attitudes towards average weight of patients. The physician was asked to indicate how much time she believed she would spend with the patient. Packets were randomly assigned to physicians. Time estimates for the average group are provided below.

Average Weight	No.
15-20	8
21-25	1
26-30	19
36-40	4
41-40	4
46-50	2

    i.   Construct a frequency histogram for this group.   (6 Marks)

    ii.   Based on your visual inspection of the histograms constructed in conjunction with question (a), would you say the data are skewed? If so, positively or negatively?

              (2 Marks)

    iii.   Calculate the standard deviation of this group.   (7 Marks)

    iv.   Calculate the standard error of this group.   (3 Marks)

    v.   Calculate Coefficient of Variation of this group.   (2 Marks)

Question 9.

(a) Define probability   (1 Mark)

(b) State three methods of data presentation   (3 Marks)

(c) In a survey of 100,000 births in Western Province, it was observed that the incidence rate of birth asphyxia deaths was 298 per 100,000 births. In a random sample of 48 births from this population, what is the probability that:

      (i) No fatal case is observed   (4 Marks)

      (ii) Only one (1) fatal case is observed   (4 Marks)

      (iii)There were two or more fatal cases   (4 Marks)

      (iv)Calculate the mean and the standard deviation   (4 Marks)

Question 10.

a) in a family of 3, find the probability of getting a boy

    b) in the same family of 3, what is the probability that all boys are expected

c) The test contains 10 questions, each one with available four different answers, among which just one is correct. To pass the test at least 5 questions must be answered correctly. What is the probability that completely unprepared student will pass the test?

    i.   What is the probability of throwing one dice and get:

        a) the even number

        b) the number divisible by three

        c) the number less than six?

d) In the class of 30 students, seven of them don't have done the homework. The teachers choose randomly 6 students. What is the chance that at least four of them have done their homework?

e) In the lottery 6 numbers are drawn out of 49. What is the probability of winning

i) the second prize (we guessed 5 numbers correctly)

ii) the third prize (we guessed 4 numbers correctly)

iii) if we were guessing just six numbers ?