



CENTRAL UNIVERSITY

END OF SECOND SEMESTER RESIT EXAMINATION: 2015/2016

FACULTY OF ARTS AND SOCIAL SCIENCES

DEPARTMENT OF ECONOMICS

ECON 104 (3 CREDITS)

INTRODUCTION TO STATISTICS

LEVEL 100

AUGUST, 2016

2 HOURS

STUDENT ID No.....

INSTRUCTIONS

ANSWER ALL QUESTIONS IN SECTION A and ANY ONE (1) QUESTION IN SECTION B

(You may use your calculator and the provided formula sheet at the last page)

**DO NOT TURN OVER THIS PAGE UNTIL YOU HAVE BEEN TOLD TO DO SO BY THE
INVIGILATOR**

LECTURER: Daniel Offei

SECTION A

Answer ALL the questions (60 marks)

Question 1

Classify each of the following as *descriptive statistics* or *inferential statistics*.

(a) The average points per game, percent of free throws made, average number of rebounds per game, and average number of fouls per game as well as several other measures for players in the NBA are computed.

(b) Ten percent of the boxes of cereal sampled by a quality technician are found to be under the labeled weight. Based on this finding, the filling machine is adjusted to increase the amount of fill.

(c) Based on a study of 500 single parent households by a social researcher, a magazine reports that 25% of all single parent households are headed by a high school dropout.

(12 marks)

Question 2

Identify *the sample* and *the population* in each of the following scenarios.

(a) In order to study the response times for emergency 911 calls in Accra, fifty "robbery in progress" calls are selected randomly over a six-month period and the response times are recorded.

(b) In order to study a new medical charting system at Central University Hospital, a representative group of nurses is asked to use the charting system. Recording times and error rates are recorded for the group.

(c) Two hundred individuals who listen to talk radio programs of various types are selected and information concerning their education level, income level, and so forth is recorded.

(12 marks)

Question 3

The table below contains the heights of 15 babies (in centimeters)

2.4	4.0	5.3
2.5	4.2	5.5
3	4.5	6.0
3.5	5.0	6.5
3.5	5.2	7.0

- i. Find the percentile of the height of a baby of 5.2 centimeters
- ii. Find the 25th percentile
- iii. Find the first quartile for the heights distribution in the table

(12 marks)

Question 4

The table below gives the cumulative frequency distribution for the daily breast-milk production in grams for 25 nursing mothers in a research study. Construct *an ogive* for this distribution.

Daily Production less than	Cumulative Frequency
500	0
550	3
600	11
650	20
700	22
750	25

(12 marks)

Question 5

The number of 911 emergency calls classified as domestic disturbance calls in a large metropolitan location were sampled for thirty randomly selected 24 hour periods with the following results.

25 46 34 45 37 36 40 30 29 37 44 56 50 47 23
40 30 27 38 47 58 22 29 56 40 46 38 19 49 50

- i. Find the **mean** number of calls per 24-hour period.
- ii. To find the **median** number of domestic disturbance calls per 24-hour period for the data
- iii. Find the **mode** for the data.

(12 marks)

SECTION B

Answer any **ONE(1)** in the following section (40 marks)

Question 1

The table below gives the frequency distribution of the ages of 5000 shoplifters in a recent psychological study of these individuals.

Age	Frequency
5-14	750
15-24	2005
25-34	1950
35-44	195
45-54	100

From the grouped data, find;

- i. The mean
- ii. The median
- iii. The modal class
- iv. The range
- v. The variance
- vi. The standard deviation

(40 marks)

Question 2

- a) Briefly describe the differences between Observational and Experimental data
- b) Briefly describe how you might design a study to investigate the relationship between smoking and lung cancer.
- c) Is your study in part (c) observational or experimental? Explain your answer.

(40 marks)

FORMULAR SHEET

MEAN

Mean for Sample of n observations:

$$\bar{x} = \frac{\sum x}{n}$$

Mean for population consisting of N observations:

$$\mu = \frac{\sum x}{N}$$

Mean for grouped data:

$$\bar{x} = \frac{\sum xf}{n}$$

VARIANCE

Variance of sample of size n:

$$s^2 = \frac{\sum(x - \bar{x})^2}{n - 1}$$

OR

$$s^2 = \frac{\sum x^2 - \frac{(\sum x)^2}{n}}{n - 1}$$

Variance of population of size N:

$$\sigma^2 = \frac{\sum(X - \mu)^2}{N}$$

OR

$$\sigma^2 = \frac{\sum x^2 - \frac{(\sum x)^2}{N}}{N}$$

Variance for grouped data:

$$s^2 = \frac{\sum x^2 f - \frac{(\sum xf)^2}{n}}{n - 1}$$