



CENTRAL UNIVERSITY

FAITH • INTEGRITY • EXCELLENCE

END OF FIRST SEMESTER EXAMINATION
2022 ACADEMIC YEAR

DEPARTMENT OF COMMUNICATION AND MEDIA
STUDIES

ECON 109: BASIC STATISTICS

2 HOURS

STUDENT ID No.

INSTRUCTIONS:

ANSWER ALL QUESTIONS IN SECTIONS A AND B.
ANSWER ONLY ONE (1) QUESTION IN SECTION C.
ALL QUESTIONS ARE TO BE ANSWERED IN THE ANSWER BOOKLET.

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

Lecturer: Mr Ernest Somua-Wiafe

SECTION A (15 marks)

1. Which of the following is an example of quantitative data?
 - (A) Favourite sport (Volley ball, Basketball, Hockey)
 - (B) Radiation levels in becquerel (Bq)
 - (C) Jersey numbers of footballers (1, 2, 3, and so on)
 - (D) University course codes (eg COMM101, CUVS213)

2. Which of the following is an example of discrete data?
 - (A) Lifetime (in hours) of 35 fluorescent light bulbs
 - (B) Temperature (in Fahrenheit) of the Pacific Ocean at Huntington Beach
 - (C) Number of hamburgers sold each day at Hamburger Mary's
 - (D) Amount of caffeine (in milligrams) for 8 ounces of popular drinks

3. Which of the following illustrates continuous data?
 - (A) satisfaction ratings (on a scale from "not satisfied" to "very satisfied") by website users
 - (B) ten-digit National Identification numbers of Ghanaians in a town
 - (C) number of female users of a website
 - (D) lengths (in meters) of broad jumps

4. Quota sample is an example of
 - (A) Random sample
 - (B) Probability sample
 - (C) Nonrandom sample
 - (D) Representative sample

5. Arrange the following levels of measurement from the highest to the lowest.
 - I. interval
 - II. ordinal
 - III. nominal
 - IV. ratio
 - (A) II, I, IV, & III
 - (B) III, IV, I & II
 - (C) III, II, I & IV
 - (D) IV, I II & III

6. Which of the following measures the centre of a distribution?
 - (A) Standard deviation and Interquartile range
 - (B) 50th percentile and the average value
 - (C) Quartiles and Interquartile range
 - (D) Mean and Percentiles

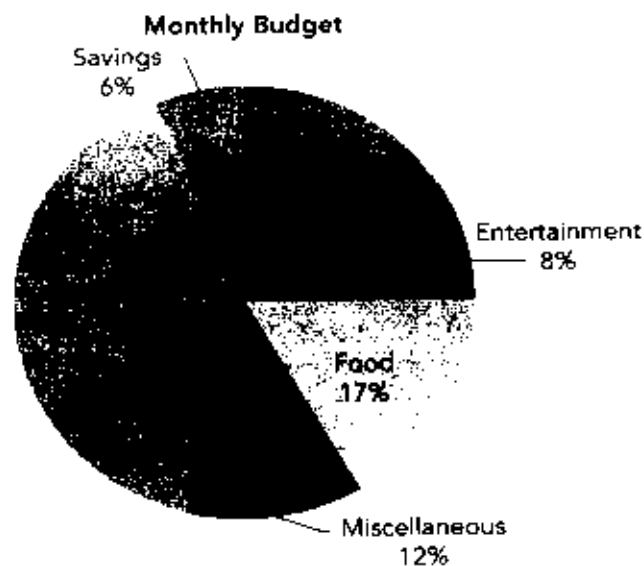
7. Which of the following measures the spread of data?
- (A) Standard deviation and Interquartile range
 - (B) 50th percentile and the average value
 - (C) Quartiles and Interquartile range
 - (D) Mean and Percentiles
8. To identify the shape of a given data, what type of graph would be the most useful?
- (A) Cumulative frequency curve
 - (B) Histogram
 - (C) Scatter plot
 - (D) Bar chart
9. Which of the following is equivalent to the 75th Percentile?
- (A) 75% of the data
 - (B) The third quartile
 - (C) 75th observation
 - (D) None of the above
10. A student is told that his score on an exam was in the 85th percentile. This means that
- (A) about 85 students in the class scored better than him
 - (B) about 15 students in the class scored worse than him
 - (C) about 85% of the students in the class scored better than him
 - (D) about 85% of the students in the class scored worse than him
11. Consider the following data as a sample. If each data value is increased by 5 what is the effect on the standard deviation?
- 15, 15, 33, 17, 30, 30, 20, 60, 45, 15
- (A) The standard deviation increase by 5.
 - (B) The the standard deviation increases by 5^2 .
 - (C) The standard deviation remains the same.
 - (D) Can't tell without solving.
12. Consider the following data as a population, and calculate the variance to three decimal places.
- 15, 33, 30, 50, 0
- (A) 359.300
 - (B) 287.440
 - (C) 8.955
 - (D) 16.954

13. Consider the following data as a sample, and calculate the variance to three decimal places.
15, 33, 30, 50. 0

- (A) 359.300
- (B) 287.440
- (C) 18.955
- (D) 16.954

Use the following for Q14 and Q15

The circle graph shown displays a budget for a monthly income of GH¢3,500 (after taxes).



14. According to the graph, how much more money is budgeted for rent than for food and clothing combined?

- (A) GH¢210
- (B) GH¢595
- (C) GH¢1,190
- (D) GH¢1,400

15. Over an entire year, how much of the monthly income is dedicated for food and entertainment combined?

- (A) GH¢7140
- (B) GH¢10500
- (C) GH¢11875
- (D) GH¢13360

SECTION B (55 marks)

(Answer all questions in this section)

1. Indicate for the following variables the level of measurement (nominal, ordinal, interval, ratio).
 - (a) weights (in pounds) of new borns at a regional hospital [2 marks]
 - (b) college classifications (freshman, sophomore, junior, senior) [2 marks]
 - (c) freezing temperatures (on a Celsius scale) of chemical mixtures [2 marks]
 - (d) ten-digit National Identification numbers of Ghanaians in a town [2 marks]
 - (e) number (0, 1, 2, or a greater integer) of people attending a conference [2 marks]

2. Newborns come in a range of healthy sizes. To a large extent, the size of the new born baby is affected by the length of the pregnancy amidst other factors. Most babies born between 37 and 40 weeks weigh somewhere between 5 pounds, 8 ounces (2,500 grams) and 8 pounds, 13 ounces (4,000 grams). If as a researcher, you are interested in statistically predicting the proportion of new born babies with weights below the expected weight at a local hospital in Accra, what would you consider as
 - (a) Population [2 marks]
 - (b) Sample [2 marks]
 - (c) Parameter [2 marks]
 - (d) Statistic [2 marks]
 - (e) Variable [2 marks]

3. Name the sampling method used in each of the following situations:

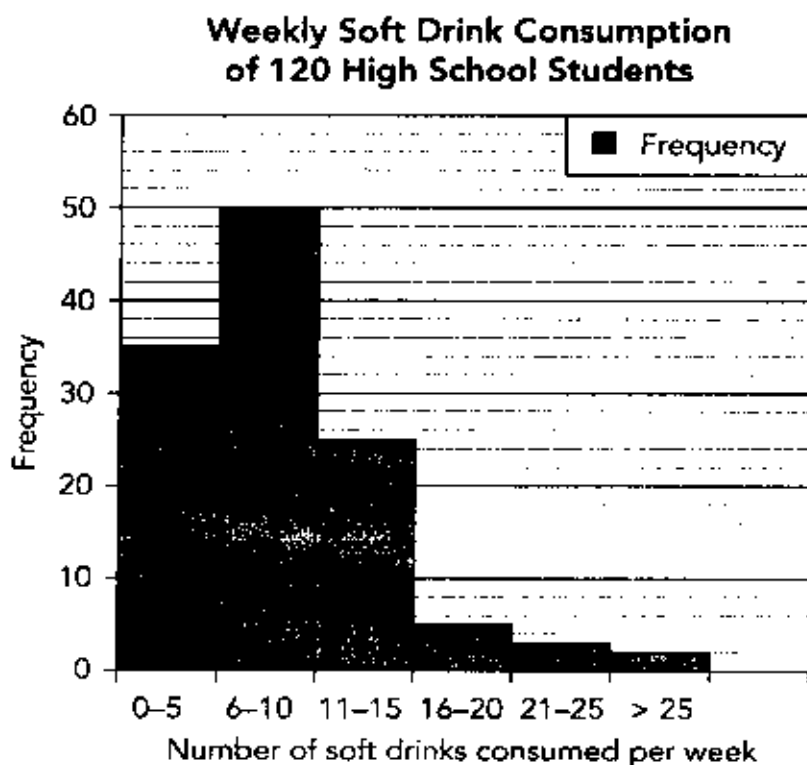
- (a) A company has 1000 employees, of whom 58% are men and 42% are women. The research department at the company wanted to conduct a quick survey by selecting a sample of 50 employees and asking them about their opinions on an issue. They divided the population of employees into two groups, men and women, and then selected 29 men and 21 women from these respective groups. The interviewers chose the first 29 men and 21 women who came out for the mid-day break. [2 marks]
- (b) Suppose the professor enters the names of all students enrolled in his class on a computer. He then selects a sample of 20 students at random using a statistical software package such as Minitab. [2 marks]
- (c) A professor wanted to select 20 students from his class of 300 students to collect detailed information on the profiles of his students. He used his knowledge and expertise to select these 20 students. [2 marks]
- (d) A statistics professor wanted to find out the average GPA (grade point average) for all Communication students at her university. With the help of random numbers, she used all students enrolled in her statistics class as a sample and collected information on their GPAs to find the average GPA. [2 marks]

4. Refer to the following dot plot below:



- (a) According to the plot, what is the mean number of minutes the 15 customers waited in line? [3 marks]
- (b) According to the plot, what is the median number of minutes the 15 customers waited in line? [3 marks]
- (c) According to the plot, what is the modal number of minutes the 15 customers waited in line? [2 marks]
- (d) Find the range of the data associated with the dot plot shown. Comment on your result. [3 marks]

5. Refer to the histogram below:



- (a) Comment about the distribution as displayed in the graph. [3 marks]
- (b) Roughly sketch a boxplot to represent the histogram above observing the variations within the quarters. Comment on the variations within the quarters as expected. [3 marks]
- (c) In a tabular form, write out the classes, frequencies, and thus calculate the percent frequency for the classes, cumulative frequency and the percent relative frequency. [5 marks]
- (d) With the help of a graph sheet, plot the percent frequency distribution for the data. [3 marks]
- (e) Based on the percent frequency distribution, about what percentage of students consume 21 soft drinks or more per week? [4 marks]
- (f) Which measure of centre is most appropriate for describing the data set associated with the graph shown above? Explain your choice. [3 marks]

SECTION C (30 marks)
(Answer only one question in this section)

1. Refer to the following dot plot below:

**Starting Weights in Pounds of 36 Female Students
Participating in a Weight-Loss Program**

Stem	Leaves
12	3 8 8 9
13	2 3 3 4 4 8 9
14	0 2 2 4 5 5 5 6 8 8 9
15	0 1 3 3 5 6 7 8 9 9
16	1 2 2 9

Legend: 12|3 = 123

- (a) According to the stem-and-leaf plot, what starting weight occurs most often? **[2 marks]**
- (b) According to the stem-and-leaf plot, approximately what percent of the 36 female participants have a starting weight of at least 145 pounds? **[3 marks]**
- (c) According to the stem-and-leaf plot, approximately what fraction of the 36 female participants have a starting weight of at between 139 and 159 inclusive? **[4 marks]**
- (d) What is the median starting weight in pounds of the 36 participants? **[4 marks]**
- (e) What value represents the 75th percentile of the given data? **[4 marks]**
- (f) Find the range of the data associated with the stem-and-leaf plot shown. **[2 marks]**
- (g) Using a class interval of 10 and class limit grouping, convert the stem-and-leaf plot into a frequency table. In addition to the frequencies, obtain the relative frequency distribution. **[6 marks]**
- (h) With the aid of a graph sheet, construct the histogram of the starting weights (in pounds) of the 36 female students participating in the weight-loss program. Comment on the shape of the graph. **[5 marks]**