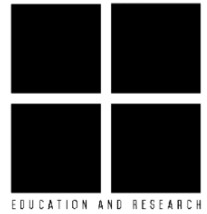




# UP SCHOOL OF STATISTICS STUDENT COUNCIL

## Education and Research



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Statistics 101  
Reviewer for Final Examination

Elementary Statistics  
S101-FE-003

**TRUE or FALSE.** Write True, if the statement is correct, and False, if otherwise. (20 pts.)

1. A sample is a subset of the population.
2. Descriptive Statistics cannot be applied to sample data, since it doesn't deal with generalizations to a larger group where the sample came from.
3. A less than ogive must be a monotone non-decreasing curve.
4. In general, the area of a frequency histogram and the area within a frequency polygon of the same data set are equal.
5. Statistic is a summary measure computed from a population data.
6. If the data collectors themselves documented the data, then the data is a primary data.
7. A sampling frame is a list or map of all the sampling units in the population.
8. The sampling unit and elementary unit of a population must be the same.
9. In probability sampling, each element of the population has a known and equal probability of inclusion.
10. Snowball sampling is a type of a nonprobability sampling.
11. In doing a Statistical inquiry, planning the study comes before the identification of the problem.
12. The variable length can be measured in any level of measurement and can be both qualitative and quantitative.
13. A measurement scale with a true or absolute zero has a ratio level of measurement.
14. In cluster sampling, it is preferred that the elements in each cluster are homogenous with each other.
15. The target population is the population from which the sample is actually taken.
16. The range is the difference between the minimum and the maximum.
17. The class mark is the midpoint of a class interval.
18. The class size is the difference of the lower class interval to its corresponding upper class interval.
19. Addition and Subtraction is not interpretable in an ordinal or nominal scale of measurement.
20. An experiment is a method of collecting data wherein there's an actual human interference with the conditions controlling the environment and administering a treatment to the subjects in order to study its effect on some other variable.

**FILL IN THE BLANKS.** (20 points)

1. Statistics can be defined as the \_\_\_\_\_ and \_\_\_\_\_ of uncertainty. It is also defined as the branch of science that deals with the \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ of data.
2. The two major fields of statistics are Applied Statistics and \_\_\_\_\_. One of the major areas of Applied Statistics is \_\_\_\_\_, which deals with the techniques that result to conclusions that are only applicable to the data on hand. The other major field of Applied Statistics is \_\_\_\_\_, which deals with analysing a sample data to make conclusions to a larger group where the sample came from.

A \_\_\_\_\_ is a characteristic of interest that can assume different values. When its value is realized, it is then called a(n) \_\_\_\_\_ and the collection of the realized values is called \_\_\_\_\_. \_\_\_\_\_ is the process of determining the value or label of the variable based on what has been observed. The lowest level of measurement is \_\_\_\_\_. \_\_\_\_\_ refer to data with observations measured using the nominal or the ordinal levels of measurements. \_\_\_\_\_ refer to data with observations measured using the interval or ratio level of measurement.

4. The population is the \_\_\_\_\_ of all items or elements one is interested in a study. The \_\_\_\_\_ is the population

about which information is desired, while the \_\_\_\_\_ is the population where the sample is actually taken as determined by a sampling frame.

**MULTIPLE CHOICE.** Write the letter of the best answer. Two points each. (30 points.)

1. The Education and Research committee head conducts a study regarding the general perception of the math 17 students in the implementation of having bigger math classes. He planned to collect the data through a survey. Since there are too many math 17 takers, he decided to take a sample of 5 math 17 discussion classes at random without replacement and let all the students in the classes chosen answer his survey. What is the probability sampling method applied by the education and research committee head in his study?
  - a. Simple Random Sampling without Replacement
  - b. Cluster Sampling
  - c. Stratified Sampling
  - d. Systematic Sampling
  
2. It is the Philippines highest policy-making body on statistical matters.
  - a. National Statistics Office (NSO)
  - b. National Economic and Development Authority (NEDA)
  - c. Bangko Sentral ng Pilipinas (BSP)
  - d. National Statistical Coordination Board (NSCB)
  
3. Which of the following statements is **NOT** true?
  - a. There's a loss of information in organizing a raw data to a frequency distribution table with class intervals.
  - b. The class sizes have to be the same across all class intervals of a frequency distribution table.
  - c. Both A and B
  - d. None of the above
  
4. Which of the following censuses is not a product of Philippine Statistical Authority?
  - a. Census of Establishments
  - b. Census of Agriculture and Fisheries
  - c. Mid-Decade Census of Population
  - d. None of the Above
  
5. A survey was conducted to determine the level of knowledge/awareness of UP students on the economic status of the Philippines. They were also asked regarding their sources of information and the major influencers in their opinions. One of the questions is about the forms of mass media, where they usually get this type of information. If multiple answers are allowed, what is the best graph to use in presenting the data gathered regarding the forms mass media being used by the students?
  - a. Pie Chart
  - b. Line Chart
  - c. Bar Chart
  - d. Scatter Plot
  
6. What among the following measurement scales has a ratio level of measurement?
  - a. Temperature in Kelvin
  - b. Temperature in Degree Celsius
  - c. Shirt Sizes (Small, Medium, Large)
  - d. IQ Scores
  
7. A marketing officer of a milk tea shop wants to know the product preference of its consumers. The marketing officer decides to conduct a product preference survey. Systematic sampling is employed. The marketing officer considered the order of customers in the cashier line as a frame for the survey. Based on the previous data of the amount of customers that enter the shop, he computed a sampling interval of 5. If the 3<sup>rd</sup>

- customer is the first one to be given the survey, who will be the 25<sup>th</sup> member of the sample?
- 121<sup>st</sup> customer
  - 122<sup>nd</sup> customer
  - 123<sup>rd</sup> customer
  - 124<sup>th</sup> customer
8. An investments officer wants to look at the trends of the peso-dollar exchange rate, peso-euro exchange rate and Philippine Stocks Exchange index over the past 10 years. He was given a monthly raw data. If he is interested in looking at the trends, what type of **graph should he construct** from the data available?
- Pie Chart
  - Line Chart
  - Bar Chart
  - Column Chart
9. Which of the following statements is **NOT** true?
- In systematic sampling, it is preferred that sampling units in the sampling frame are arranged in a random order.
  - In simple random sampling, all sampling units are given an equal chance of being included in the sample.
  - It is ideal to have the same target population and sampled population.
  - In stratified sampling, the selection of a sample in a stratum affects the selection of sample in other strata.
10. Which among the following methods of gathering data has the least human intervention applied?
- Interview Survey
  - Self-Administered Survey
  - (Phenomena) Observation
  - Experimentation
11. In a nominal scale of measurement, the numbers in the system are used to classify a variable onto categories. What should be the characteristics of these categories?
- i. Distinct/Distinguishable    ii. Mutually Exclusive    iii. Exhaustive
- i only
  - i and iii only
  - i, ii and iii
  - none of the above
12. Frequency values in a frequency polygon are plotted against\_\_\_\_\_.
- Lower class boundaries
  - Upper class boundaries
  - Class sizes
  - Class marks
13. In systematic sampling, the method begins by picking a random start then the next members of the sample is taken every Kth unit from the ordered population thereafter. The value of K is called \_.
- Sampling interval
  - Sampling fraction
  - Sample size
  - Sampling factor
14. In a survey, respondents may not answer a particular question. Hence, there's no response. "No Response" is encoded by first classifying the kind of non-response. Which among the following is not a probable label for a "No Response"?

- a. Not Applicable
- b. Missing
- c. Don't Know/No opinion
- d. Undecided

15. This type of table has the simplest layout. It contains no table title or column headings and has no table borders. This table needs a descriptive statement so that the reader can understand the given figures. Footnotes may be placed just like in other types of table. What type of tabular presentation is being referred?
- a. Leader Work
  - b. Text Tabulation
  - c. Formal Statistical Table
  - d. None of the above

**PROBLEM SOLVING.** Answer the following problems as required. (45 points)

1. The quality control officer of a car battery manufacturer wants to explore the potential areas of improvement in the performance of their car batteries. He gathered the length of lives of 40 similar car batteries based from the car battery replacement records of the company. It is tabulated below and is rounded off to the nearest tenth of a year. (25 points.)

CAR BATTERY LIVES (in years)

2.2	4.1	3.5	4.5	3.2	3.7	3.0	2.6
3.4	1.6	3.1	3.3	3.8	3.1	4.7	3.7
2.5	4.3	3.4	3.6	2.9	3.3	3.9	3.1
3.3	3.1	3.7	4.4	3.2	4.1	1.9	3.4
4.7	3.8	3.2	2.6	3.9	3.0	4.2	3.5

- a. Determine the class size and the number of class intervals using the Sturgis formula. (2 pts.)
  - b. Construct a frequency distribution table with the class intervals, class boundaries, class marks, frequency and relative frequency. (8 pts.)
  - c. Construct a frequency histogram and frequency polygon with the proper labels. Describe the distribution of car battery lives using the histogram/polygon. Do not superimpose the two graphs. (8 pts.)
  - d. Construct the less than and greater than ogives. (7 pts.)
2. The head of the community health and nutrition department of a municipality wants to check the gravity of malnutrition of young children in the day care center of the local government unit. The ages of the children range from 2 to 6 years old. There are 40 children in the day care center. The department head collected the weight, height and age of the children in the day care center. She computed the body mass index of each child. She then tabulates the ages and the BMIs as seen below. (20 pts.)

AGE	BMI	AGE	BMI	AGE	BMI	AGE	BMI
2	17	4	18	3	16	5	17
2	15	4	25	2	17	4	19
3	20	5	27	4	21	3	15
4	19	5	20	5	21	2	21
3	20	3	21	6	30	4	17
4	22	4	19	6	29	6	29
3	21	3	20	2	20	2	18
4	28	4	32	4	33	3	20
2	17	5	19	4	28	4	17
5	19	6	32	5	23	4	29

- Construct a bar graph for the ages of the children, with title and proper axes labels. (5 pts.)
- Construct a frequency distribution table for the BMIs of the children according to the following its classification: underweight (less than 18.5), normal (18.5 to 25), overweight (25, 30) and obese (greater than 30). (10 pts.)
- Consider only the underweights; construct a bar graph of the number of underweights according to age. Describe the graph. (5 pts.)

References:

- \*Elementary Statistics by Prof. Josefina Almeda, Prof. Therese Ann Capistrano and Prof. Genelyn Ma. Sarte (available at UP Press)
- Introduction to Statistics 3<sup>rd</sup> Ed. By Ronald E. Walpole
- Statistics 114: Descriptive Statistics Course Notes (A.Y. 2009-2010) by Prof. Josefina Almeda
- Statistics 115: Basic Statistical Methods Course Notes (A.Y. 2009-2010) by Prof. Josefina Almeda
- [www.nscb.gov.ph](http://www.nscb.gov.ph)
- [www.psa.gov.ph](http://www.psa.gov.ph)

*\*recommended reference material for Statistics 101*