



Statistics 114

Sample First Long Examination

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I. IDENTIFICATION. Identify the following concepts/terms.

1. type of sampling method where all possible subsets containing n distinct elements have the same chances of selection
2. general classification of sampling methods where every element under study is given a nonzero chance of selection and the chance of selecting any sample of size n can be determined
3. area in Statistics that consists of methods that allow a researcher to make generalizations about some characteristic of the population using the information that is contained in the collected sample
4. list of all sampling units
5. method of collecting data where the respondents are asked questions
6. method of collecting data where there is human intervention on the actual environment in order to control extraneous factors in the study
7. type of question where the respondent is given a list of responses to choose from
8. level of measurement of academic rank using the following scale: 1 – instructor, 2 – assistant professor, 3 – associate professor, 4 – full professor
9. level of measurement of temperature in Kelvin
10. level of measurement of marital status using the following scale: 1 – single, 2 – married, 3- widowed, 4 – separated/divorced
11. level of measurement where the zero value is interpreted as the absence of the characteristic being measured and the unit of measure is constant throughout the scale
12. level of measurement where the numbers or symbols are used for the sole purpose of classifying the subjects under study
13. data that was gathered by the same researcher/agency that published the report
14. type of study where information is taken from every element of the population
15. summary measure that describes a particular characteristic of the population
16. summary measure that describes a particular characteristic of the sample
17. the government agency that designates the statistics that will be collected by the different government agencies in the Philippines
- 18-20. three agencies in the Philippine Statistical System whose primary task is to collect and analyze data

II. MULTIPLE CHOICE. Write the letter that corresponds to the best answer.

1. Which of the following does not belong?
 - a) stratified sampling
 - b) systematic sampling
 - c) convenience sampling
 - d) multi-stage sampling
2. If the size of the population is 50000 and the sample size is 100 then the sampling interval under systematic sampling is
 - a) 0.5
 - b) 50
 - c) 500
 - d) 5000000

3.

Statement A: Drawing a sample using simple random sampling will always require a list of all elements in the population.

Statement B: In cluster sampling, it is ideal to form clusters so that the elements are heterogeneous with respect to the characteristic being studied within each cluster.

Which of the following is true?

- a) Only Statement A is true.
- b) Only Statement B is true.
- c) Both Statements A and B are true.
- d) Both Statements A and B are false.

4.

Statement A: Using the self-administered questionnaire is more appropriate than an interview schedule for probing sentiments underlying an expressed opinion.

Statement B: In general, the use of self-administered questionnaires yields a lower response rate than the use of an interview schedule.

Which of the following is true?

- a) Only Statement A is true.
- b) Only Statement B is true.
- c) Both Statements A and B are true.
- d) Both Statements A and B are false.

5. "Do you like your man to be tall, dark and handsome?" is an example of a

- a) leading question
- b) biased question
- c) prestige question
- d) double-barreled question

III. Answer the following concisely.

1. What are the three main methods of collecting original data? Cite one advantage each for using these methods.

2. Enumerate the main steps in conducting a statistical inquiry.

3. Enumerate the main steps in constructing a questionnaire.

4. Consider the question: "There are many different types of sports like badminton, basketball, billiards, bowling, and tennis. Which type of sport do you enjoy watching?" What type of question is this? Why do we not recommend the use of this type of question in a questionnaire?

5. Suppose a researcher is interested in the effects of hours of sleep on the scores in a math exam. Ten groups consisting of three students each were formed in such a way that all the three students in the group have the same IQ. Students within a group are randomly assigned to get 2, 5 or 8 hours of sleep prior to the exam.

- a. What method of data collection was used by the researcher?
- b. How many treatments are there in this study?
- c. What is the response variable?
- d. What is the extraneous variable that the researcher controlled in this study?

6. A researcher wishes to determine the average size of the faculty in public elementary schools. For this study, he selected a sample of public elementary schools and asked the principals in the selected schools for the number of fulltime teachers in their faculty who teach in grade school.

- a. What method of data collection was used by the researcher?
- b. What is the parameter of interest in this study?
- c. What are the elements in this study?

IV. Use the list of 57 different car models on the next 2 pages to select a sample of size 12 using the indicated sampling method. Show all pertinent steps. Use the table of random numbers in generating the required numbers. Start at Row 5, Col 10 to $(10+j-1)$ where j is the number of columns needed.

1. use random sampling without replacement (you may write on the questionnaire in labeling the cars)
2. use stratified random sampling with type of car as the stratification variable (use proportional allocation)
3. use systematic sampling

<u>Manufacturer</u>	<u>Model</u>	<u>Type</u>	<u>Engine Size (in liters)</u>	<u>Maximum Horsepower</u>
Acura	Integra	Small	1.8	140
Acura	Legend	Midsize	3.2	200
Audi	90	Compact	2.8	172
Audi	100	Midsize	2.8	172
BMW	535i	Midsize	3.5	208
Buick	Century	Midsize	2.2	110
Buick	LeSabre	Large	3.8	170
Buick	Roadmaster	Large	5.7	180
Buick	Riviera	Midsize	3.8	170
Cadillac	DeVille	Large	4.9	200
Cadillac	Seville	Midsize	4.6	295
Chevrolet	Cavalier	Compact	2.2	110
Chevrolet	Corsica	Compact	2.2	110
Chevrolet	Camaro	Sporty	3.4	160
Chevrolet	Lumina	Midsize	2.2	110
Chevrolet	Lumina APV	Van	3.8	170
Chevrolet	Astro	Van	4.3	165
Chevrolet	Caprice	Large	5.0	170
Chevrolet	Corvette	Sporty	5.7	300
Chrysler	Concorde	Large	3.3	153
Chrysler	LeBaron	Compact	3.0	141
Chrysler	Imperial	Large	3.3	147
Dodge	Colt	Small	1.5	92
Dodge	Shadow	Small	2.2	93
Dodge	Spirit	Compact	2.5	100
Dodge	Caravan	Van	3.0	142
Dodge	Dynasty	Midsize	2.5	100
Dodge	Stealth	Sporty	3.0	300
Eagle	Vision	Large	3.5	214
Ford	Festiva	Small	1.3	63
Ford	Escort	Small	1.8	127
Ford	Tempo	Compact	2.3	96
Ford	Mustang	Sporty	2.3	105
Ford	Probe	Sporty	2.0	115
Ford	Aerostar	Van	3.0	145

(cont'd)

Ford	Taurus	Midsize	3.0	140
Ford	Crown Victoria	Large	4.6	190
Geo	Metro	Small	1.0	55
Geo	Storm	Sporty	1.6	90
Honda	Prelude	Sporty	2.3	160
Honda	Civic	Small	1.5	102
Honda	Accord	Compact	2.2	140
Hyundai	Exel	Small	1.5	81
Hyundai	Elantra	Small	1.8	124
Hyundai	Scoupe	Sporty	1.5	92
Hyundai	Sonata	Midsize	2.0	128
Infiniti	Q45	Midsize	4.5	278
Lexus	ES300	Midsize	3.0	185
Lexus	SC300	Midsize	3.0	225
Lincoln	Continental	Midsize	3.8	160
Lincoln	Town Car	Large	4.6	210
Mazda	323	Small	1.6	82
Mazda	Protégé	Small	1.8	103
Mazda	626	Compact	2.5	164
Mazda	MPV	Van	3.0	155
Mazda	RX-7	Sporty	1.3	255
Mercedes-Benz	190E	Compact	2.3	130