

## Chapter 2 Exam Review – Collecting Data

MDM4U

Jensen

1) A type of sampling where people choose themselves by responding to a general invitation to take part in a survey.

- a) simple
- b) convenience
- c) systematic
- d) **voluntary**

2) State the type of random sampling that requires all selections and combinations of selections are equally likely. This type of sampling may not end up being representative of the population, but any deviations are due only to chance.

- a) stratified
- b) multi-stage
- c) **simple**
- d) clustered
- e) systematic

3) A study that considers individuals from different groups at the same time is called:

- a) longitudinal
- b) **cross-sectional**
- c) census
- d) time series

4) These types of variables can not be measured numerically. They place individuals in to one of several groups or categories.

- a) quantitative
- b) discrete
- c) continuous
- d) **qualitative**

5) Refers to the entire group that is the focus of the study.

- a) **population**
- b) sample
- c) census
- d) longitudinal

6) State the type of random sampling that requires that the population be organized into groups. Randomly groups are chosen and all members in the chosen groups are surveyed.

- a) stratified
- b) multi-stage
- c) simple
- d) clustered**
- e) systematic

7) State the type of random sampling that divides the population into groups. Then a simple random sample of the members of each group is taken. The size of the sample for each group is proportionate to the group's size.

- a) stratified**
- b) multi-stage
- c) simple
- d) clustered
- e) systematic

8) A numeric variable that can have an infinite number of values in a given interval. Measurable with all real numbers.

- a) quantitative
- b) discrete
- c) continuous**
- d) qualitative

9) State the type of random sampling that is used when you are sampling a fixed percent of the population. A random starting point is chosen and then you select every  $n$ th individual for your study where  $n$  is the sampling interval.

- a) stratified
- b) multi-stage
- c) simple
- d) clustered
- e) systematic**

10) State the type of random sampling that requires that the population be organized into groups. A random sample of groups is chosen and then a random sample of the members of the chosen groups is taken.

- a) stratified
- b) multi-stage**
- c) simple
- d) clustered
- e) systematic

11) State the type of study that considers individuals over a long period of time.

- a) **longitudinal**
- b) cross-sectional
- c) census
- d) time series

12) Information gathered from the entire population is called a:

- a) population
- b) sample
- c) **census**
- d) longitudinal

13) A variable that is measured using numerical values for which it makes sense to find an average.

- a) **quantitative**
- b) discrete
- c) continuous
- d) qualitative

14) State the type of bias that occurs when factors in the surveying method or design influence the result (i.e. poor question design, extraneous information, interviewer tone or attitude)

- a) sampling
- b) **response**
- c) non-response
- d) household
- e) discrete

15) State the type of bias that occurs when one type of respondent is over represented because groupings of different sizes are polled equally instead of proportionately.

- a) sampling
- b) response
- c) non-response
- d) **household**
- e) discrete

16) Refers to part of a population selected so as to gain information about the whole population.

- a) population
- b) **sample**
- c) census
- d) longitudinal

17) State the type of bias that occurs when an individual chosen for the sample can't be contacted or refuses to participate.

- a) sampling
- b) response
- c) non-response**
- d) household

18) State the type of bias that occurs when the chosen sample does not represent the population.

- a) sampling**
- b) response
- c) non-response
- d) household
- e) discrete

19) Identify the type of bias that might result from each of the following data collection methods.

a) A survey designed to see which extra curricular activity should get more funding is given to the King's Christian Collegiate hockey team. All surveys are collected at the end of practice and all members were present.

**Which extra-curricular activity do you consider to be the best? Circle only one.**

Ceramics      **Hockey**      Photography      Strings      Ensemble      Tennis

**SAMPLING BIAS – the hockey team does not represent all of King's students  
RESPONSE BIAS – "hockey" being bigger may influence the results**

b) A survey is given to 50 male and 50 female students at KCC regarding cell phones in the school. All surveys are collected. There are 310 female students and 250 male students that go to KCC. students.

**HOUSEHOLD BIAS – males are overrepresented. An equal percent of each gender should be surveyed.**

c) A survey is sent home with all students for parents to complete regarding the usage of ipod and mp3 players in the school. The students are to return the survey the following day.

**NON-RESPONSE BIAS – not all surveys will be returned**

d) Mr. Bulhuis conducts 1 on 1 interviews with students at King's to see if they think physical education is important enough to make it mandatory to take each year in high school.

**RESPONSE BIAS – students may be afraid to give their honest opinion about phys-ed to the athletic director of the school.**

20) Identify which sampling method is being used.

a) The student parliament Prime Minister decides to survey the KCC student body. Students are organized into groups by grade and then two groups are randomly chosen and all the students in the chosen groups are surveyed.

**CLUSTER**

b) Mr. Jensen decides to survey students about their Mathematical interests. He puts all the students' names in a box and randomly selects 200 names.

**SIMPLE**

c) The guidance counsellors decide to survey a fixed percent of the grade 9 student body to find out if they have had a positive experience in the first year at KCC. They randomly select a starting point and then they select every 12<sup>th</sup> grade 9 student on an alphabetized attendance roster to be surveyed.

**SYSTEMATIC**

d) Mr. DeBoer groups the students by homeroom. He randomly selects 10 of the groups and then randomly selects people from each selected group to be surveyed.

**MULTI-STAGE**

e) Mr. Lee decides to survey students at KCC. He divides the students into groups according to their homeroom. Then a simple random sample of the students in each group is taken. The size of the sample for each group is proportionate to the group's size.

**STRATIFIED**

21) What are the four principles of experimental design?

a) **COMPARISON**: Use a design that compares two or more treatments

b) **RANDOM ASSIGNMENT**: Use chance to assign experimental units to different treatments.

c) **CONTROL**: Keep other variables (besides the ones you are testing) that might affect the response of the subject the same for all groups.

d) **REPLICATION**: Use enough experimental units in each group so that any differences in the effects of the treatments can be distinguished from chance differences between groups

22) In an experiment, the collection of individuals to which treatments are applied to are called

- a) **experimental units**
- b) explanatory units
- c) response units
- d) treatment units

**Use the following scenario to answer questions 23, 24, and 25:** In a clinical trial, 30 patients with a certain blood disease are randomly assigned to two groups. One group is then randomly assigned the currently marketed medicine, and the other group receives the new experimental medicine. Each week, patients report to the clinic where blood tests are conducted. The lab technician is unaware of the kind of medicine the patient is taking, and the patient is also unaware of which medicine he or she has been given.

23) The scenario described above is an example of

- a) an observational study
- b) an experiment with blocking
- c) **a completely randomized experiment**
- d) a stratified random sample

24) Which of the following strategies is used in the design

- a) **double blind**
- b) placebo
- c) blocking
- d) matched pairs

25) State each of the following based on the described scenario:

- a) the experimental units – **THE 30 PATIENTS**
- b) the explanatory variable – **TYPE OF MEDICINE GIVEN**
- c) the response variable – **RESULTS OF BLOOD TEST**
- d) the treatment(s) used – **CURRENTLY MARKETED MEDICINE AND NEW EXPERIMENTAL MEDICINE**

**26)** A teacher wants to know if listening to music while studying affects exam performance. There are 30 students in his class. 12 students have A's going in to the exam, 10 have B's, and 8 have a C or lower. He wants to make some students listen to music while studying, and not allow others to listen while studying. He then wants to compare exam scores to draw conclusions.

**a)** Describe the explanatory and response variables in this situation

**EXPLANATORY – USE OF MUSIC WHILE STUDYING**  
**RESPONSE – EXAM SCORE**

**b)** How could the teacher use blocking to help improve this experiment

**THE PROFESSOR COULD GROUP ALL STUDENTS WITH A'S TOGETHER, ALL STUDENTS WITH B'S TOGETHER, AND ALL STUDENTS WITH C'S OR LOWER TOGETHER. THEN, WITHIN EACH GROUP SEPARATELY, RANDOMLY ASSIGN HALF OF THE STUDENTS TO LISTEN TO MUSIC WHILE STUDYING AND THE OTHER HALF TO NOT LISTEN TO MUSIC WHILE STUDYING.**

**c)** Could the teacher use a placebo to help improve the experiment? Explain.

**A PLACEBO IS A 'FAKE' TREATMENT. PLACEBO'S ARE USED TO 'BLIND' THE EXPERIMENTAL UNITS FROM KNOWING WHETHER OR NOT THEY ARE RECEIVING THE REAL TREATMENT OR NOT. IN THIS EXPERIMENT, IT IS NOT POSSIBLE TO USE A PLACEBO. THERE IS NO WAY TO MAKE A PERSON THINK THEY ARE LISTENING TO MUSIC IF THEY ARE NOT.**