1) What definition best represents “statistics”?

a) Any study that involves an experiment

b) The science of collecting and interpreting data that describes or summarizes something

c) Talking to a population of people and recording what they say

d) Data that gets put into graphs and charts for review

2) Which statement best describes the importance of having a representative sample?

a) Representative samples are just as accurate as non-representative samples.

b) Representative samples are truly random and have the same characteristics as the population, meaning anyone in the population has an equal chance of being selected.

c) Representative samples always include 20% of the population.

d) Representative samples provide accurate information and non-representative samples do not.

3) Which sample is the most representative of determining the opinion of people who live in a certain community about a new neighborhood curfew policy?

a) Surveying people who are at the park on a Saturday morning

b) Surveying people who go to a nearby grocery store

c) Surveying people from homes on a single street

d) Surveying every 5th house on every street in the community

**Use this scenario to answer questions 4 – 8.**

*NBC wanted to know how many Americans watched the season finale of The Office. The studio used a computer program to gather television viewing data from 5000 random homes and determined that 63% of households watched the episode.*

4) Which of the following correctly describes the SAMPLE from the scenario above?

a) 63% of households watched the episode

b) American households with televisions

c) How many people watched the season finale of The Office

d) 5000 household with televisions

5) Which of the following correctly describes the POPULATION from the scenario above?

a) 63% of households watched the episode

b) American households with televisions

c) How many people watched the season finale of The Office

d) 5000 household with televisions

6) Which of the following correctly describes the SAMPLE STATISTICS from the scenario above?

a) 63% of households watched the episode

b) American households with televisions

c) How many people watched the season finale of The Office

d) 5000 household with televisions

7) Which of the following correctly describes the POPULATION PARAMETERS from the scenario above?

a) 63% of households watched the episode

b) American households with televisions

c) How many people watched the season finale of The Office

d) 5000 household with televisions

8) Which sampling method was used to select the sample in the scenario above?

a) Simple Random Sampling b) Systematic Sampling

c) Convenience Sampling d) Stratified (subgroup) Sampling

**Use this scenario to answer questions 9 – 13.**

*Agricultural specialists from Maricopa county perform inspections to determine if the use of a pesticide on crops at farms in the county negatively effects the crops growth. 25 crops were collected and tested from 30 different farms in the county. It was determined that there is only a 4% chance that the pesticide would hinder the crop growth.*

9) Which of the following correctly describes the POPULATION from the scenario above?

a) Farms from the county of Maricopa

b) 25 crops from 30 different farms

c) 4% chance that pesticide hinders crop growth

d) Effects of pesticide on the crops

10) Which of the following correctly describes the POPULATION PARAMETERS from the scenario above?

a) Farms from the county of Maricopa

b) 25 crops from 30 different farms

c) 4% chance that pesticide hinders crop growth

d) Effects of pesticide on the crops

11) Which of the following correctly describes the SAMPLE from the scenario above?

a) Farms from the county of Maricopa

b) 25 crops from 30 different farms

c) 4% chance that pesticide hinders crop growth

d) Effects of pesticide on the crops

12) Which of the following correctly describes the SAMPLE STATISTICS from the scenario above?

a) Farms from the county of Maricopa

b) 25 crops from 30 different farms

c) 4% chance that pesticide hinders crop growth

d) Effects of pesticide on the crops

13) Which sampling method was used to select the sample in the scenario above?

a) Simple Random Sampling b) Systematic Sampling

c) Convenience Sampling d) Stratified (subgroup) Sampling

14) Which statement best describes the difference between an experiment and an observational study?

a) An observational study only measures and records data where an experiment attempts to influence data by applying some form of treatment.

b) An experiment only measures and records data where an observational study attempts to influence data by applying some form of treatment.

c) An experiment involves interacting with sample members and an observational study does not

d) An experiment involves gathering quantifiable data where an observational study involves gathering opinions.

15) Which type of study should be used to determine the following information:

*Which of eight airlines has the lowest percentage of delayed flights?*

a) Experiment b) Observational Study

16) Which type of study should be used to determine the following information:

*Is acupuncture a more effective way to treat muscle pain than taking over-the-counter medicine or doing nothing at all?*

a) Experiment b) Observational Study

17) Does the statement make sense? *I wanted to test whether taking a multivitamin helps prevent colds, so I gave the treatment group the multivitamin and I gave the control group Vitamin C.*

a) Yes it makes sense because the treatment and control groups are receiving different treatments.

b) Yes it makes sense because all experiments should have a treatment and control group.

c) No it does not make sense because the control group should not receive a different treatment, they should receive a placebo.

d) No it does not make sense because the control group should also be given to the control group.

18) Does the statement make sense? *My experimental study involved interviews, but I still trust the information because the experiment was double-blind.*

a) No it does not make sense because you can never trust any data collected from interviews.

b) Yes it makes sense because all double-blind experiments are correct.

c) Yes it makes sense because the experiment should be double-blind when interviews are involved so the interviewer does not accidentally influence the interviewee based on what group they are in.

d) No it does not make sense because double-blind means the interviewers don’t know who is in what group but the interviewees do know, which makes the interview data invalid.

19) Determine the type of data for the following scenario: *Birth months of individuals*

a) Qualitative b) Quantitative

20) Determine the type of data for the following scenario: *Annual salaries of major league baseball players*

a) Qualitative b) Quantitative

21) Determine the type of data for the following scenario: *Amount of rainfall each year in a specific city*

a) Qualitative b) Quantitative

22) Which statement best describes the difference between qualitative and quantitative data?

a) Qualitative data describes number counts and measurements while quantitative data describes various categories

b) Qualitative data describes opinions while quantitative data describes facts

c) Quantitative data describes opinions while qualitative data describes facts

d) Quantitative data describes number counts and measurements while qualitative data describes various categories

23) Which graphs should be used when representing QUANTITATIVE data?

a) Histograms and Bar graphs b) Histograms and Line graphs

c) Pie Charts and Bar graphs d) Pie Charts and Line graphs

24) Identify the characteristics of Histograms (circle ALL that apply)

a) bar height represents frequency b) bars can be in any order

c) frequencies should be percentages d) bars should be touching and be the same width

25) Identify the characteristics of Pie Charts (circle all that apply)

a) pie wedges can be in any order b) pie wedges should be touching

c) pie wedges can be any size / width d) frequencies should be percentages that add to 100%

26) You have a histogram you want to convert into a line graph. A good first step would be to:

a) make a list of all the categories in alphabetical order

b) place a dot at the top of each bar in the center of the bar

c) calculate the relative frequency of each bar and change into a percent

d) reorder the bars from highest frequency to lowest frequency

27) Determine the correlation between the following variables: *Hours worked & Salary earned*

a) Positive Correlation b) Negative Correlation c) No Correlation

28) Determine the correlation between the following variables: *Car speed & Distance travelled*

a) Positive Correlation b) Negative Correlation c) No Correlation

29) Determine the correlation between the following variables: *Pencil length & Number of times sharpened*

a) Positive Correlation b) Negative Correlation c) No Correlation

30) Does the statement make sense? *There is a strong negative correlation between the price of tickets and the number of tickets sold. This suggests that if we want to sell a lot of tickets, we should lower the prices.*

a) No it does not make sense because there should be a positive correlation.

b) Yes it makes sense because you should always lower prices, regardless of what the data says.

c) Yes it makes sense because the negative correlation is enough to suggest a pattern between the two variables.

d) No it does not make sense because it is merely a coincidence and a negative correlation is not enough to suggest a pattern.

31) Does the statement make sense? *There is a strong positive correlation between the amount of time studying and the grade in math class. I conclude that increasing studying time causes better grades.*

a) No it does not make sense because a correlation is not enough to state one thing causes another.

b) Yes it makes sense because studying more will always make your grades better.

c) Yes it makes sense because any time a correlation exists it means one variable caused the other.

d) No it does not make sense because there should be a negative correlation between studying and grades.

**ANSWER KEY**

1. B
2. B
3. D
4. D
5. B
6. A
7. C
8. A
9. A
10. D
11. B
12. C
13. D
14. A
15. B
16. A
17. C
18. C
19. A
20. B
21. B
22. D
23. B
24. A, D
25. A, B, D
26. B
27. A
28. A
29. B
30. C
31. A