1. Which of these is the key characteristic of science?
   A) It involves formal and systematic observation.
   B) It involves the use of laboratories.
   C) It is performed by professors.
   D) It results in technological advances.

2. Which of these is a goal of science?
   A) inquiry
   B) Internal validity
   C) description
   D) discovery

3. The goals of science include description, explanation, control, and:
   A) expectation.
   B) prescription.
   C) confirmation.
   D) prediction.

4. The goal of science that involves the manipulation of antecedent conditions to affect behavior is called:
   A) control.
   B) explanation.
   C) prediction.
   D) disconfirmation.

5. The goal of science that involves the accurate portrayal of a certain phenomenon is known as:
   A) control.
   B) explanation.
   C) description.
   D) evaluation.

6. The goal of science that involves learning about how and why a phenomenon exists is known as:
   A) control.
   B) explanation.
   C) description.
   D) proving.

7. A scientist who believes that behavior is orderly and systematic and does not happen by chance holds the basic assumption of science known as:
   A) discoverability.
   B) empiricism.
   C) descriptivism.
   D) determinism.

8. Dr. Le believes that humans behave in orderly ways, and it is possible to detect this orderliness . Dr. Le appears to believe in an assumption of science known as:
   A) parsimony.
   B) precision.
   C) discoverability.
   D) generativity.

9. Jill develops the theory that students learn better from lectures than from reading. Sam believes that this theory is not very good because it is unclear what Jill means by "better." In other words, Jill's theory lacks:
   A) precision.
   B) discoverability.
   C) parsimony.
   D) generativity.

10. Which of these is a criterion of a good theory?
   A) usefulness
   B) empiricism
   C) entropy
   D) pseudoscience

11. Professor Fisk has developed a theory that contains statements that are verifiable by experimentation. The professor's theory has met the criterion for a "good" theory that is known as:
   A) parsimony.
   B) precision.
   C) discoverability.
   D) testability.

12. Ting believes that if you die in a dream you will also die in real life. Karen points out that if someone dies in his or her sleep we could never find out what happened in the dream. Thus, there is no way to demonstrate support for Ting's theory. His theory lacks:
    A) precision.
    B) parsimony.
    C) testability.
    D) determinism.

13. The scientific philosopher Karl Popper stated that science is really about:
    A) generating as many theories as possible in order to advance science.
    B) proving that theories are true based on experimental data.
    C) ruling out alternative explanations until one explanation or theory fits the data.
    D) creating new theories, even if no one ever tests them.

14. This criterion of a good theory states that it should be practical and help to describe, explain, and predict an important phenomenon. Thus, a good theory must be:
    A) systematic.
    B) useful.
    C) deterministic.
    D) testable.

15. Professor Sandhurst collects data from employees before developing a theory of job satisfaction. This approach is known as:
    A) reduction.
    B) deduction.
    C) induction.
    D) postduction.

16. The approach to science that involves starting with a theory and propositions and then collecting data to test those propositions is:
    A) reduction.
    B) induction.
    C) production.
    D) deduction.

17. Researchers are using _____ when they start with data and create a theory to explain it; and they are using _____ when they start with a theory and collect data to support or refute that theory.
    A) induction; deduction
    B) deduction; induction
    C) reduction; induction
    D) induction; reduction

18. Sofia has heard about a theory that suggests that when people are in a group they tend to put forth less effort than when they work alone. She decides to collect some data to see if they support this theory. Sofia is using:
    A) deduction.
    B) reduction.
    C) parsimony.
    D) induction.

19. When considering whether to begin scientific research with data or with theory, it is important to know that the approach taken by most distinguished scientists is one that:
    A) combines both inductive and deductive processes.
    B) uses the deductive process only.
    C) uses the inductive process only
    D) uses the reductive process only.

20. Professor Sanchez has data from an experiment that indicate that being treated rudely by a boss leads to employees missing work more often. With such data the professor can draw a(n):
    A) causal inference.
    B) deductive inference.
    C) inductive inference.
    D) conclusive inference.

21. Which research design is the ONLY design in which we can assert that one variable is causing another variable?
    A) survey research
    B) case study research
    C) experimental research
    D) archival research

22. In an experiment, a researcher is investigating the effects of two types of rewards on employee motivation. The independent variable in this experiment is:
    A) the type of rewards.
    B) employee motivation.
    C) employee performance.
    D) employee salary.

23. Dr. Applesmith conducts a study in which he manipulates the light in a room while assessing participants' performance on a counting task. In this example, the light is the _____, and the performance on the counting task is the _____.
    A) dependent variable; independent variable
    B) extraneous variable; dependent variable
    C) independent variable; dependent variable
    D) independent variable; extraneous variable

24. In an experiment, the variable of interest—that is, the variable the experiment is designed to assess—is known as the:
    A) independent variable.
    B) dependent variable.
    C) causal variable.
    D) internal variable.

25. The type of variable that can contaminate the results of an experiment and may be an alternative to a causal relationship is known as a(n):
    A) predictor variable.
    B) criterion variable.
    C) extraneous variable.
    D) antecedent variable.

26. Dr. Wickersham wants to examine how light affects participants' performance on a counting task. So she has two groups, one that works under dim light, and one that works under bright lights. She finds that those in the dim-light condition perform better. However, one of her research assistants admits that he gave those in the dim-light condition extra time to complete the task. Now Dr. Wickersham is not sure whether those in the dim-light condition did better because of the lighting or because of the extra time they received. The extra time on the test is an example of a(n):
    A) independent variable.
    B) dependent variable.
    C) criterion variable.
    D) extraneous variable.

27. Independent variables are frequently referred to as:
    A) predictors.
    B) criteria.
    C) confounds.
    D) outcomes.

28. “Predictors,” “precursors,” and “antecedents” are all words we might use to describe:
    A) extraneous variables.
    B) independent variables.
    C) dependent variables.
    D) criterion variables.

29. “Criteria,” “outcomes,” and “consequences” are all words we might use to describe:
    A) extraneous variables.
    B) independent variables.
    C) dependent variables.
    D) predictor variables.

30. Dr. Xiong conducts a study examining whether people feel more motivated when music is playing versus when there is silence. At first, his findings appear to indicate that those in the “music condition” do better. However, he learns that his research assistant encouraged the participants in the music condition but did not encourage those in the silent condition. Now, Dr. Xiong doesn't know whether the better performance was due to the music or the encouragement. Dr. Xiong's study has poor:
    A) external validity.
    B) extraneous validity.
    C) content validity.
    D) internal validity.

31. _____ is the extent to which we can draw causal inferences about the variables in an experiment.
    A) External validity
    B) Extraneous validity
    C) Content validity
    D) Internal validity

32. The extent to which results in an experiment generalize to other people, settings, and times is referred to as:
    A) internal validity.
    B) external validity.
    C) empirical validity.
    D) experimental control.

33. When an experiment uses college students as participants, some people may raise concerns that the results are not generalizable to employees in the "real world." This represents a concern about:
    A) content validity.
    B) construct validity.
    C) external validity.
    D) internal validity.

34. One way to demonstrate the external validity of an experiment is to:
    A) replicate the results with different participants, in different settings, and at different times.
    B) rule out all extraneous variables affecting the independent variable.
    C) implement statistical control to minimize variability in the experiment.
    D) manipulate different levels of the independent variable.

35. Dr. Chinua is conducting a lab study. The situation is very artificial, and participants may not always behave normally. However, Dr. Chinua can very carefully control the conditions so that he can be certain that the effects that he sees on the dependent variable result from changes in the independent variable. His research is high in _____, but low in _____.
    A) internal validity; external validity
    B) external validity; internal validity
    C) internal validity extraneous validity
    D) extraneous validity; internal validity

36. Dr. Begley is conducting a study in a factory in which she is examining whether having employees wear uniforms affects their job satisfaction. In this study, her sample is very representative of other factory workers; however, because the employees work in an actual workplace, she cannot control other things that might affect their satisfaction. Her research is high in _____, but low in _____.
    A) internal validity; external validity
    B) external validity; internal validity
    C) internal validity; extraneous validity
    D) extraneous validity; internal validity

37. The first step in any research project is to:
    A) design the study and consider validity.
    B) formulate testable hypotheses.
    C) decide how data will be collected from participants.
    D) use statistical analysis to make sense of the data.

38. After designing a study, the next step in the research process involves:
    A) developing hypotheses.
    B) testing the hypotheses.
    C) reporting results.
    D) collecting data.

39. When research participants have an equally likely chance of being assigned to an experimental condition or the control condition, the experimenter has:
    A) manipulated the independent variable.
    B) demonstrated external validity.
    C) employed random assignment.
    D) set up a quasi-experiment.

40. A researcher is conducting an experiment to test the effect of feedback on job performance. The researcher can exercise control over extraneous variables, such as intelligence, by:
    A) using participants with the same level of intelligence.
    B) using participants with the same level of job performance.
    C) giving all participants the same type of feedback.
    D) randomly assigning participants to feedback conditions.

41. Laboratory experiments are typically:
    A) high in internal validity and low in external validity.
    B) low in internal validity and high in external validity.
    C) generalizable to any workplace situation.
    D) conducted in real-world work settings.

42. Which of these is a primary characteristic of quasi-experiments?
    A) the use of animal subjects instead of human subjects
    B) use of intact groups and manipulation of independent variables
    C) eliminating extraneous variables
    D) a laboratory setting

43. What is the key difference between an experiment and a quasi-experiment?
    A) Quasi-experiments do not include dependent variables.
    B) Quasi-experiments do not include independent variables.
    C) Quasi-experiments do not include random assignment.
    D) Quasi-experiments cannot be used in a real-world setting.

44. Studies using observational methods are sometimes called:
    A) correlational designs.
    B) regression designs.
    C) archival designs.
    D) meta-analyses.

45. Using _____, we can conclude ONLY that results either do or do not indicate a relationship between the variables of interest.
    A) observational methods
    B) field experiments
    C) true experiments
    D) laboratory experiments

46. Which of these is the LEAST common method of collecting data in I/O psychology research?
    A) naturalistic observation
    B) surveys
    C) case studies
    D) archival research

47. Amy, using an archival data set for her research, notices that the data were collected on March 1, 1999, from a group of army leaders. This data set is:
    A) longitudinal.
    B) cross-sectional.
    C) normally distributed.
    D) unobtrusive.

48. Meena, using an archival data set for her research, notices that the data were collected from the same group of children when they were in first, second, and third grade. This data set is:
    A) longitudinal.
    B) cross-sectional.
    C) normally distributed.
    D) unobtrusive.

49. Which method of data collection is MOST frequently used in I/O psychology?
    A) unobtrusive naturalistic observation
    B) experience sampling methodology
    C) surveys
    D) case studies

50. What is one drawback of using self-administered mail surveys in research?
    A) It is difficult to administer them.
    B) They cannot be administered to large groups of people.
    C) Response rates can be low.
    D) There is a lack of respondent anonymity.

51. Lily is conducting a study about emotions at work. She uses smartphone apps to signal participants at predetermined times to answer questions. Lily is using the data collection approach known as:
    A) longitudinal design.
    B) case studies.
    C) experience sampling methodology (ESM).
    D) naturalistic observation.

52. If a practitioner gives a math test to a group of participants at two points in time, and finds that the high scorers on the first test are also the high scorers on the second test, the test has demonstrated:
    A) content validity.
    B) test–retest reliability.
    C) interrater reliability.
    D) internal consistency.

53. Professor Lang has created a new measure of intelligence. She administers the test to a number of participants. Two weeks later, she administers the same test to the same people. Professor Lang is examining:
    A) content validity.
    B) interrater reliability.
    C) test–retest reliability.
    D) parallel forms reliability.

54. Test–retest reliability is often called a:
    A) coefficient of equivalence.
    B) coefficient of stability.
    C) Cronbach's coefficient alpha.
    D) split-half reliability.

55. The extent to which items on a test are interrelated and hang together is referred to as:
    A) parallel forms reliability.
    B) content validity.
    C) divergent validity.
    D) internal consistency.

56. Split-half reliability, inter-item reliability, Cronbach's coefficient alpha, and the Kuder-Richardson 20 are all measures of:
    A) interrater reliability.
    B) parallel forms reliability.
    C) internal consistency.
    D) criterion-related validity.

57. In I/O psychology, a rule of thumb for the reliability of measures is to have reliability levels of AT LEAST:
    A) .45.
    B) .50.
    C) .60.
    D) .70.

58. _____ is the degree to which a test or predictor covers a representative sample of the quality being assessed.
    A) Criterion-related validity
    B) Parallel-forms reliability
    C) Content validity
    D) Internal consistency

59. Beatrice has created a test to measure high school students' math ability. However, she includes only questions on addition and subtraction, even though most high school students also know other procedures (such as division and multiplication). Because her test does not measure everything that should be considered as part of math ability in this group, her test has low:
    A) predictive validity.
    B) concurrent validity.
    C) content validity.
    D) interrater validity.

60. Aneen wants to know which students will succeed in a gifted program, so she administers a test at the beginning of the year. At the end of the year, she finds that the test results correlate with those students' grades. The test has demonstrated:
    A) content validity.
    B) predictive validity.
    C) concurrent validity.
    D) divergent validity.

61. Jerome wants to determine whether a test can identify employees who will be top performers. He administers his test to his employees, and he finds that its results correlate with their current performance. He has demonstrated:
    A) content validity.
    B) predictive validity.
    C) concurrent validity.
    D) divergent validity.

62. If one develops a new measure of employee motivation and demonstrates that the measure is not related to dissimilar constructs, then he/she has demonstrated:
    A) concurrent validity.
    B) predictive validity.
    C) divergent validity.
    D) internal consistency.

63. Which of these is a stipulation of the APA ethical code for conducting research?
    A) Researchers can never use participant deception.
    B) Research studies must be approved by the APA.
    C) Research participants' data must always be held confidential.
    D) There are no ethical requirements for the care and use of animals in research.

64. _____ involves providing research participants with information about the purpose of the study, their right to decline participation, the potential risks and benefits to participants, and where to direct questions about the research.
    A) Informed consent
    B) Ethical consent
    C) Participant code of conduct
    D) Deception consent

65. The MOST frequent single score in a distribution is called the:
    A) mode.
    B) mean.
    C) median.
    D) variance.

66. In the data set 3 5 5 6 7 8 8 9 10 10 10 15 17 20 20, what is the mode?
    A) 8
    B) 9
    C) 10
    D) 20

67. In the data set 3 5 5 6 7 8 8 9 10 10 10 15 17 20 20, which number represents the median of the distribution?
    A) 5
    B) 9
    C) 10
    D) 20

68. In the data set 3 5 5 6 7 8 8 9 10 10 10 15 17 20 20, what is the range?
    A) 8
    B) 10
    C) 15
    D) 17

69. _____ is the most useful measure of dispersion and is calculated by subtracting scores from the mean, adding the squared differences, and dividing the sum by the total number of scores.
    A) Range
    B) Variance
    C) Standard deviation
    D) Mode

70. In a normal distribution, 99% of observations fall within:
    A) one standard deviation above the mean.
    B) two standard deviations above the mean.
    C) two standard deviations above and below the mean.
    D) three standard deviations above and below the mean.

71. A _____ provides information about the direction and magnitude of the relationship between two or more variables.
    A) median
    B) correlation coefficient
    C) standard deviation
    D) mean

72. One would expect that someone who has a high SAT score will also earn a high GPA in college. In this case, one would expect a _____ between SAT scores and GPA.
    A) positive correlation
    B) negative correlation
    C) zero correlation
    D) null correlation

73. One would expect that the higher a GPA that someone has, the fewer classes he or she skips. In this case, one would expect a _____ between GPA and classes skipped.
    A) positive correlation
    B) negative correlation
    C) null correlation
    D) nondirectional correlation

74. Which correlation indicates the strongest relationship?
    A) .07
    B) –.23
    C) .53
    D) –.76

75. Correlations are relevant to I/O psychology because they are involved in making:
    A) concessions.
    B) predictions.
    C) causal inferences.
    D) surveys.

76. If the correlation between variable A and variable B is .20, then variable A explains _____ of the variance in variable B.
    A) .02
    B) .04
    C) .20
    D) .40

77. When squaring a correlation coefficient (r^2), the resulting value tells how much variance in the criterion is explained by the predictor. This statistic is also known as the coefficient of:
    A) explanation.
    B) determination.
    C) stability.
    D) equivalence.

78. Which statistical and methodological technique is used for conducting quantitative literature reviews?
    A) meta-analysis
    B) deduction
    C) experience sampling methodology (ESM)
    D) correlation coefficient

79. Which of these is a goal of science?
    A) explanation
    B) evocation
    C) provocation
    D) recovery

80. Which of these is a goal of science?
    A) capitalism
    B) internal validity
    C) control
    D) external validity

81. The goals of science include description, explanation, prediction, and _____.
    A) proscription
    B) prescription
    C) prevention
    D) control

82. A scientist who believes that the best way to understand behavior is to use data to test theories believes in :
    A) discoverability.
    B) empiricism.
    C) descriptivism.
    D) determinism.

83. Marta develops a theory that suggests filling out a job application in crayon will lead to a lower probability of being hired. However, almost nobody fills out an application in crayon, so this finding will not affect anyone in a meaningful way. Marta's theory lacks:
    A) precision.
    B) parsimony.
    C) usefulness.
    D) determinism.

84. Dr. Omari develops a theory that suggests that paying interviewers for each interview they conduct will improve their performance. However, no other researchers seem to be interested in this theory, and nobody tests this theory. Dr. Omari's theory demonstrates poor:
    A) precision.
    B) parsimony.
    C) generativity.
    D) determinism.

85. Darnell works in HR. He notices in his HR data that managers who speak more than one language have more satisfied employees. He proposes the theory that language skills relate to better communication skills with subordinates. Darnell is using:
    A) deduction.
    B) reduction.
    C) parsimony.
    D) induction.

86. What is the cyclical inductive–deductive model of research?
    A) It is the idea that inductive processes are superior to deductive processes.
    B) It is the idea that deductive processes are superior to inductive processes.
    C) It is the idea that testing theories is a continuous process that uses both induction and deduction.
    D) It is the fact that the more inductive studies we do on a topic, the less appropriate deductive methods become.

87. Dependent variables are frequently referred to as:
    A) predictors.
    B) criteria.
    C) confounds.
    D) outcomes.

88. Extraneous variables can severely damage which type of validity?
    A) external
    B) content
    C) independent
    D) internal

89. Claudette writes a tentative statement about the relationship between two variables based on a theory she has read. The research stage Claudette is MOST LIKELY engaged in when she does this is:
    A) designing a study.
    B) collecting data.
    C) writing up results.
    D) formulating a hypothesis.

90. Quasi-experiments tend to have lower _____ than regular experiments.
    A) external validity
    B) extraneous validity
    C) content validity
    D) internal validity

91. Midna is conducting a study examining the relationship between absenteeism and coworker relationships. She's not interested in whether one variable causes the other; she just wants to learn whether they are related. The best design for Midna to use to answer this question is a(n):
    A) observational method.
    B) field experiment.
    C) lab experiment.
    D) true experiment.

92. A case study is an example of a(n):
    A) observational method.
    B) field experiment.
    C) lab experiment.
    D) true experiment.

93. Which of these would NOT be a type of data collection one would use for an observational method of research?
    A) a lab experiment
    B) a survey
    C) a case study
    D) archival research

94. Rani obtains a Cronbach's alpha of .20. Rani's measure has:
    A) poor test–retest reliability.
    B) excellent test–retest reliability.
    C) poor internal consistency.
    D) excellent internal consistency.

95. Beula has a new measure of charisma. She finds that her measure correlates .75 with another measure of charisma and correlates .45 with a measure of kindness. Based on this information, which statement is true?
    A) She has convergent validity of .45.
    B) She has divergent validity of .45.
    C) She has content validity of .45.
    D) She has predictive validity of .45.

96. Robbi has a new measure of dutifulness. She finds that her measure correlates .62 with another measure of dutifulness and correlates .35 with a measure of orderliness. Based on this information, which statement is true?
    A) She has convergent validity of .62.
    B) She has divergent validity of .62.
    C) She has content validity of .62.
    D) She has predictive validity of .62.

97. Before starting an experiment, Dr. Cortez asks a participant to read a detailed description of a study and its risks and benefits, and sign a statement indicating he agrees to participate in the research. This procedure is known as:
    A) test validation.
    B) participant code of conduct.
    C) informed consent.
    D) Ethical objection.

98. In a data set, we note a strong relationship between motivation and happiness: Individuals with low motivation also demonstrate low happiness. Which correlation would MOST LIKELY describe this relationship?
    A) +.50
    B) +.05
    C) .00
    D) -.50

99. Chatna is a math teacher. She teaches two sections of math and wants to make sure her students don't cheat on the test. She creates two different versions of a math test, and ensures that they measure the same thing and are equally difficult. Chatna has established:
    A) content validity.
    B) parallel forms reliability.
    C) internal consistency.
    D) concurrent validity

100. Agatha has created a test of organization, and wants to know whether it relates to performance on the job. In this example, Agatha is MOST concerned with:
    A) content validity.
    B) internal consistency.
    C) parallel forms reliability.
    D) criterion-related validity.

Answer Key

1. A
2. C
3. D
4. A
5. C
6. B
7. D
8. C
9. A
10. A
11. D
12. C
13. C
14. B
15. C
16. D
17. A
18. D
19. A
20. A
21. C
22. A
23. C
24. B
25. C
26. D
27. A
28. B
29. C
30. D
31. A
32. B
33. C
34. A
35. A
36. B
37. B
38. D
39. C
40. D
41. A
42. B
43. C
44. A

45. A
46. A
47. B
48. A
49. C
50. C
51. C
52. B
53. C
54. B
55. D
56. C
57. D
58. C
59. C
60. B
61. C
62. C
63. C
64. A
65. A
66. C
67. B
68. D
69. B
70. D
71. B
72. A
73. B
74. D
75. B
76. B
77. B
78. A
79. A
80. C
81. D
82. B
83. C
84. C
85. A
86. C
87. B
88. D
89. D
90. D

91. A
92. A
93. A
94. C
95. B
96. A
97. C
98. A
99. C
100. D

1. Identify and describe the four main goals of science.

2. What are three of the five criteria of a good theory?

3. What are the main differences in the inductive and deductive approaches to science?

4. Describe the components of the cyclical inductive–deductive model of research.

5. Describe two ways in which I/O psychologists can control for extraneous variables in research.

6. Identify and describe the steps involved in the research process. Be sure to explain what happens at each step in the process.

7. Identify and describe two of the additional stipulations set forth by the Ethical Principles of Psychologists and Code of Conduct of the American Psychological Association (beyond the five general principles).

8. How are experimental methods of research different from other research methods?

9. Identify and describe two observational methods of research. For each method, discuss an advantage of its use.

10. Describe two prominent ways researchers can assess the reliability of a scale.

11. Briefly describe the differences between predictive validity and concurrent validity. Then, for one of these types of validity, briefly describe how to conduct a relevant study to provide this evidence.

12. Briefly identify and describe three measures of central tendency and three measures of dispersion.

13. Draw a normal distribution, including the standard deviations and the percentage of observations within the standard deviation units.

14. Assume that a .80 correlation exists between class attendance and class grades. Graph this correlation, putting class grades on the y-axis and class attendance on the x-axis. Also, compute the coefficient of determination for this relationship.

15. Provide an example of a deductive approach to a research question and an inductive approach to the same research question.

16. Briefly explain what internal validity is and what external validity is. What can be done in research to improve internal validity and external validity?

17. The textbook notes that there is a trade-off between internal and external validity. Explain what this means, and provide an illustration of how a researcher might increase internal validity at the expense of external validity.

18. Explain the difference between an experiment and a quasi-experiment. Which approach has higher internal validity? Why?

19. What is the difference between a field experiment and a lab experiment? How do they differ in terms of internal validity and external validity?

20. Describe two ways in which technology has changed the way researchers conduct surveys.

Answer Key

1. Description: the accurate portrayal of the phenomenon of interest. Explanation: the identification of one or more conditions that occur prior to the phenomenon. Prediction: the ability to anticipate an event prior to its actual occurrence. Control: the manipulation of antecedent conditions to affect behavior.
2. Parsimony, precision, testability, usefulness, and generativity.
3. Induction involves working from data to theory. Deduction involves starting with a theory and propositions and collecting data to test those propositions.
4. Theory development: where deduction starts; coming up with a theory to explain human behavior. Data collection: where induction starts; collecting data to test hypotheses based on a theory. Theory refinement: comparing data to theory, determining if it is supported, or if the theory needs to be refined based on the data. Additional data collection: where more data are collected to test new aspects of a theory.
5. Holding extraneous variables constant. Manipulating different levels of extraneous variables. Using statistical control.
6. Formulate the hypothesis. Design the study. Collect data. Analyze the data. Report the findings. Start the process over for the next study.
7. Research studies must be approved by the supporting institution (usually through an Institutional Review Board). Research participants are to be treated fairly and their decision to participate must be an informed one.
8. They use random assignment, and they manipulate variables. These techniques allow us to draw causal inferences.
9. Naturalistic observation, which allows us to see people in their natural environment. Case studies, which provide lots of details. Archival research, which receive rich data that have already been collected. Surveys, which are common and are cheap and quick to administer.
10. Split-half reliability and Cronbach's alpha.
11. Predictive validity involves measuring a predictor before one measures the criterion. Concurrent validity involves measuring a predictor at the same time as the criterion. Examples will vary.
12. Measures of central tendency include mean, median, and mode. Measures of dispersion include range, variance, and standard deviation.
13. Students should draw a curve with 34% between the mean and ±1SD, 13.5% between ±1SD and ±2SD, and 2% between ±2SD and ±3SD.
14. Students should create a graph that has data in an oval pattern that goes from the lower left-hand corner of the graph to the upper right-hand corner of the graph. They should square .80 to obtain the coefficient of determination (.64).
15. Responses will vary. A deductive approach starts with a theory and collects data to test the theory. An inductive approach starts with data and devises a theory based on those data.
16. Internal validity is the extent to which one can draw causal inferences about variables, and it depends on the design (experimental is best) and controls (i.e., eliminating extraneous variables). External validity is the extent to which results of an experiment generalize to other people, settings, and times. This can be improved by using representative samples to collect additional data.

17. Studies that have high internal validity often take place in labs or under other artificial conditions, and thus lack external validity. Studies that include a large representative sample in a field setting have high external validity, but lose control and thus have lower internal validity.
18. Experiments have random assignment to conditions, while quasi-experiments do not. Experiments have better internal validity because they have more control over extraneous variables.
19. Field experiments take place in an environment outside a laboratory, such as a workplace. Laboratory experiments take place within research labs. Field experiments have high external validity but low internal validity. Laboratory experiments have high internal validity but low external validity.
20. Researchers can use online surveys. Researchers can more easily use Experience Sampling Methodology, in which people are randomly signaled to fill out a short survey. Researchers can obtain panels of participants through MTurk and similar websites.