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Test Items for Chapter 2

MULTIPLE CHOICE

1. What is the scale of measurement for the number of words recalled in a memory experiment?
   a. nominal
   b. ordinal
   c. interval
   d. ratio
   ANS: D **DIF:** Easy **REF:** Section 2.1

2. What is the scale of measurement for ratings of how "likable" a person is based on a photograph of the person's face?
   a. nominal
   b. ordinal
   c. interval
   d. ratio
   ANS: B **DIF:** Easy **REF:** Section 2.1

3. What is the scale of measurement for the percentage of faint tones a listener correctly detects in a listening test?
   a. nominal
   b. ordinal
   c. interval
   d. ratio
   ANS: D **DIF:** Easy **REF:** Section 2.1

4. What is the scale of measurement of college basketball teams?
   a. nominal
   b. ordinal
   c. interval
   d. ratio
   ANS: A **DIF:** Easy **REF:** Section 2.1

5. What is the scale of measurement of academic majors?
   a. nominal
   b. ordinal
   c. interval
   d. ratio

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ANS: A **DIF:** Easy **REF:** Section 2.1

6. What is the scale of measurement of class rankings of students?
   a. nominal
   b. ordinal
   c. interval
   d. ratio

   ANS: B **DIF:** Easy **REF:** Section 2.1

7. What is the scale of measurement for the time it takes a person to respond to a randomly presented stimulus in a visual detection task?
   a. nominal
   b. ordinal
   c. interval
   d. ratio

   ANS: D **DIF:** Easy **REF:** Section 2.1

8. What is the scale of measurement for the method of reading instruction?
   a. nominal
   b. ordinal
   c. interval
   d. ratio

   ANS: A **DIF:** Easy **REF:** Section 2.1

9. What is the scale of measurement for an individual's net worth in U.S. dollars (note that a person's net worth can be below zero because a person can be in debt)?
   a. nominal
   b. ordinal
   c. interval
   d. ratio

   ANS: C **DIF:** Easy **REF:** Section 2.1

10. What is the scale of measurement for ratings of self-esteem on an 11-point scale?
    a. nominal
    b. ordinal
    c. interval
    d. ratio

    ANS: B **DIF:** Easy **REF:** Section 2.1

11. What is the scale of measurement for a letter grade on a paper assignment?
    a. Nominal

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b. Ordinal
c. Interval
d. Ratio

ANS: B **DIF:** Easy **REF:** Section 2.1

12. If a university could admit only 4,000 applicants and use high school GPA as the sole criterion for admission, what statistic would you select as the basis for quickly determining the GPA cut-off for admission?
    a. frequency
    b. conditional proportion
    c. cumulative frequency
    d. cumulative proportion

    ANS: C **DIF:** Moderate **REF:** Section 2.2=

13. If you wanted to compare the distribution of high school GPAs for in-state and out-of-state applicants to a university, what statistic would you select to make the comparison?
    a. frequency
    b. proportion
    c. conditional proportion
    d. cumulative proportion

    ANS: C **DIF:** Moderate **REF:** Section 2.2

14. If you wanted to compare the distribution of high school GPAs for all applicants to the university with the GPA distribution of applicants at other public universities, what statistic would you compute on the dataset for the university?
    a. frequency
    b. proportion
    c. cumulative proportion
    d. cumulative frequency

    ANS: B **DIF:** Moderate **REF:** Section 2.2

15. If you wanted to present the distribution of majors at University X in such a way that the distribution could be readily compared with the distribution of majors at other universities, what would you select as your summary statistic?
    a. frequency
    b. proportion
    c. conditional proportion
    d. cumulative proportion

    ANS: B **DIF:** Moderate **REF:** Section 2.2

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16. If you wanted to compare how majors are distributed for males versus females attending University X, what would you select as your summary statistic?
    a. frequency
    b. proportion
    c. conditional proportion
    d. cumulative proportion
    ANS: C **DIF:** Moderate **REF:** Section 2.2

17. Data is gathered at a large university on the number of students in each of the 17 different majors in the College of Arts and Sciences. The results are summarized in a table. Which of the following is the best choice of titles for the table?
    a. different majors at University X
    b. the distribution of majors at University X
    c. the number of students majoring in different subjects at University X
    d. a frequency distribution for University X
    ANS: C **DIF:** Easy **REF:** Section 2.3

18. Data is gathered at a large university on the number of students in each of 17 majors in a College of Arts and Sciences. Which of the following options is the best way to label the values of the variable of "Major" on the *x*-axis of a graph of the data?
    a. start with the largest major and end with the smallest major
    b. start with the smallest major and end with the largest major
    c. group the majors according to whether they are in the humanities, the social sciences, or the natural sciences (e.g., English, History, . . . , Anthropology, Psychology, . . . , Biology, Chemistry, . . .)
    d. sequence the majors alphabetically (e.g., Anthropology, Biology, Chemistry, . . ., Statistics)
    ANS: D **DIF:** Moderate **REF:** Section 2.3

19. Data is gathered at a large university on the number of students in each of 17 majors in a College of Arts and Sciences. If you were to use a graph to present the data on the distribution of majors, what type of graph would you choose?
    a. bar graph
    b. histogram
    c. polygon
    d. cumulative frequency graph
    ANS: A **DIF:** Easy **REF:** Section 2.3

NARRBEGIN: Table 2.1

Grade	A	B	C	D	E	Total
Pre-major Courses	1,485	1,638	943	326	119	4,511

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Core Courses	642	868	597	236	75	2,418
Lab Courses	95	134	91	41	35	396
Capstone Courses	72	84	61	22	11	250
Total	2,294	2,724	1,692	625	240	7,575

NARREND

20. Based on the table, what proportion of all grades were "As"?
    a. 0.196
    b. 0.303
    c. 0.229
    d. none of the available

    ANS: B **DIF:** Moderate **REF:** Section 2.3 **NAR:** Table 2.1

21. Based on the table, what proportion of all grades were a "C" or better?
    a. 0.223
    b. 0.338
    c. 0.886
    d. none of the available

    ANS: C **DIF:** Moderate **REF:** Section 2.3 **NAR:** Table 2.1

22. Based on the table, what proportion of all grades were below a "C"?
    a. 0.114
    b. 0.338
    c. 0.223
    d. none of the available

    ANS: A **DIF:** Moderate **REF:** Section 2.3 **NAR:** Table 2.1

23. Based on the table, what percentage of students in lab courses earned a "B" or higher?
    a. 57.8
    b. 30.0
    c. 66.2
    d. none of the available

    ANS: A **DIF:** Moderate **REF:** Section 2.3 **NAR:** Table 2.1

24. Based on the table, what proportion of students in capstone courses earned a "C" or lower?
    a. 0.132
    b. 0.338
    c. 0.376
    d. none of the available

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ANS: C **DIF:** Moderate **REF:** Section 2.3 **NAR:** Table 2.1

25. Based on the table, what proportion of students in core courses earned a "B" or higher?
    a. 0.871
    b. 0.624
    c. 0.662
    d. none of the available

    ANS: B **DIF:** Moderate **REF:** Section 2.3 **NAR:** Table 2.1

26. Based on the table, what proportion of students in pre-major courses earned a "C" or lower?
    a. 0.099
    b. 0.338
    c. 0.298
    d. none of the available

    ANS: D **DIF:** Moderate **REF:** Section 2.3 **NAR:** Table 2.1

27. Based on the table, if you used "A" and "B" grades as your criterion for "good" performance in a course, in which category of courses were the grades the best?
    a. pre-major courses
    b. core courses
    c. lab courses
    d. capstone courses

    ANS: A **DIF:** Moderate **REF:** Section 2.3 **NAR:** Table 2.1

28. Based on the table, what is the most common grade across all courses?
    a. A
    b. B
    c. C
    d. D

    ANS: B **DIF:** Moderate **REF:** Section 2.3 **NAR:** Table 2.1

29. Based on the table, if you wanted to construct a new table to compare the grade distributions for the different categories of courses, what summary statistic would you choose?
    a. frequency
    b. cumulative frequency
    c. proportion
    d. conditional proportion

    ANS: D **DIF:** Moderate **REF:** Section 2.3 **NAR:** Table 2.1

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30. If the department had only enough room in its capstone courses to admit 250 students per year and it decided to use performance in lab courses as the criterion for deciding which students to admit to the capstone courses, what statistic should the department select as the basis for quickly deciding what grade in capstone courses should serve as the cut-off for admission to the capstone courses?
    a. frequency
    b. cumulative frequency
    c. cumulative proportion
    d. conditional proportion
    ANS: B **DIF:** Moderate **REF:** Section 2.3 **NAR:** Table 2.1

31. Data is collected on the distribution of times it takes college students to complete a final exam in math. There are over 2,000 observations to be organized, and the observed times range from a low of 28 minutes to a high of 126 minutes. The distribution of times is continuous and "bell-shaped" over that range. The observations need to be grouped in intervals. How many intervals should be created, approximately?
    a. four
    b. 10
    c. 20
    d. 75
    ANS: C **DIF:** Moderate **REF:** Section 2.3

NARRBEGIN: Scenario 2.1
Data is collected on the distribution of weights of adult males in the U.S. in 2020. There are millions of observations to be organized, and the observed weights range from a low of 95 lbs. to a high of 400 lbs (ignoring the rare cases of weights over 400 lbs).
NARREND

32. If you used 20 intervals to group scores between 95 and 400, what should the width of the intervals be?
    a. 10
    b. 15
    c. 20
    d. 25
    ANS: B **DIF:** Moderate **REF:** Section 2.3 **NAR:** Scenario 2.1

33. If you used 20 intervals of width 15 to group weights between 95 and 400 lbs., what should the lower limits of the intervals be?
    a. 95, 110, 125, 140, . . .
    b. 90, 105, 120, 135, 150, . . .
    c. 85, 100, 115, 130, 145, . . .

d. 80, 95, 110, 125, 140, . . .

ANS: B **DIF:** Moderate **REF:** Section 2.3 **NAR:** Scenario 2.1

34. If you constructed a graph to present a distribution for which you had grouped observations into intervals of: 80-89.99, 90-99.99, 100-109.99, . . . , how would you label the values on the *x*-axis if you use proportions of observations falling in each interval as your summary statistic?
    a. 80–89.99, 90–99.99, 100–109.99, 110–119.99, . . .
    b. 80–90, 90–100, 100–110, 110–120, . . .
    c. 85, 95, 105, 115, . . .
    d. 80, 90, 100, 110, . . .

    ANS: C **DIF:** Moderate **REF:** Section 2.3 **NAR:** Scenario 2.1

35. If you constructed a graph to present a distribution for which you had grouped observations into intervals of: 80–89.99, 90–99.99, 100–109.99, . . . , how would you label the values on the *x*-axis if you wanted to construct a cumulative frequency graph?
    a. 80–89.99, 90–99.99, 100–109.99, 110–119.99, . . .
    b. 80–90, 90–100, 100–110, 110–120, . . .
    c. 85, 95, 105, 115, . . .
    d. 80, 90, 100, 110, . . .

    ANS: D **DIF:** Moderate **REF:** Section 2.3 **NAR:** Scenario 2.1

36. Data is gathered on the number of employees at each of the top 50 businesses in New York City. The results are summarized in a table. Which of the following is the best choice of a title for the table?
    a. the top 50 businesses in NYC
    b. the number of employees in NYC
    c. a frequency distribution for the number of employees in NYC
    d. the number of employees at the top 50 businesses in NYC

    ANS: D **DIF:** Moderate **REF:** Section 2.3

37. Data is gathered on the number of employees at each of the top 50 businesses in New York City. The results are summarized in a graph. What label should be used for the variable on the *x*-axis of the graph?
    a. frequency
    b. proportion
    c. company
    d. employees

    ANS: C **DIF:** Easy **REF:** Section 2.3

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38. Data is gathered on the number of employees at each of the top 50 businesses in New York City. The results are summarized in a graph. What label should be used for the variable on the *y*-axis?
    a. frequency
    b. proportion
    c. company
    d. employees
    ANS: A **DIF:** Easy **REF:** Section 2.3

39. Data is gathered on the number of employees at each of the top 50 businesses in New York City. The results are summarized in a graph. What type of graph should be used?
    a. bar graph
    b. histogram
    c. polygon
    d. cumulative frequency graph
    ANS: A **DIF:** Easy **REF:** Section 2.3

40. Data is gathered on the number of employees at each of the top 50 businesses in New York City. The results are summarized in a graph. How should the names of the 50 businesses be organized in a table or graph so that the data for a particular company can be most quickly located?
    a. order the company names, beginning with the company with the fewest employees and ending with the company with the most employees
    b. order the company names, beginning with the company with the most employees and ending with the company with the fewest employees
    c. order the names of the companies alphabetically
    d. organize the companies by sectors (e.g., financial institutions, merchandise, manufacturing, etc.)
    ANS: C **DIF:** Moderate **REF:** Section 2.3

COMPLETION

41. A _____ is a measurement that has more than one possible value.
    ANS: variable
    DIF: Moderate **REF:** Section 2.1

42. A _____ is a listing of all the possible values of a variable, along with a measurement of each value of the variable. (e.g., frequency, proportion).
    ANS: distribution
    DIF: Moderate **REF:** Section 2.1

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43. A variable on a _____ scale of measurement has no numerical properties.
ANS: nominal
DIF: Easy **REF:** Section 2.2

44. A variable on a _____ scale of measurement has values that are ordered.
ANS: ordinal
DIF: Easy **REF:** Section 2.2

45. A variable on a _____ scale of measurement has values that are ordered and equally spaced on a number line.
ANS: interval
DIF: Easy **REF:** Section 2.2

46. A variable on a _____ scale of measurement has values that are ordered, equally spaced, and has a true zero point.
ANS: ratio
DIF: Easy **REF:** Section 2.2

47. _____ is a count of how many times a value of a variable occurs in a set of observations.
ANS: Frequency
DIF: Easy **REF:** Section 2.2

48. The _____ of times a value of a variable occurs is the frequency of the value in a set of observations divided by the total number of observations in the set.
ANS: proportion
DIF: Easy **REF:** Section 2.2

49. A _____ _____ is the proportion of times a value of a variable occurs within a subset of observations (e.g., the proportion of psychology majors who are premed).
ANS: conditional proportional
DIF: Moderate **REF:** Section 2.2

50. The _____ _____ of some value of a variable is the sum of the frequency of that value with the frequencies of all lower values of the variable.
ANS: cumulative frequency
DIF: Moderate **REF:** Section 2.2

51. A _____ _____ should be used when graphing nominal or ordinal scale data.
ANS: bar graph

DIF: Easy **REF:** Section 2.3

52. A _____ or _____ should be used when graphing interval or ratio scale data.
ANS: polygon; histogram
DIF: Moderate **REF:** Section 2.3

53. When creating intervals of scores for tabulating the distribution of an interval or ratio scale measurement, the _____ _____ of each interval should be an even multiple of the width of the intervals.
ANS: lower limit
DIF: Moderate **REF:** Section 3: Presenting Distributions in Tables and Graphs

ESSAY

NARRBEGIN: Table 2.2

Weighted H.S. GPA	In-state	Out of state	Total
≥ 4.0	293	169	462
3.75–3.999	611	294	905
3.5–3.749	1,234	623	1,857
3.25–3.49	1,058	465	1,523
3.0–3.249	675	412	1,087
2.75–2.999	513	222	735
2.5–2.749	101	195	296
≤ 2.499	23	65	88
Total	4,508	2,445	6,953

NARREND

54. Based on the table, what proportion of all applicants had a high school GPA of 4.0 or greater?
ANS: 0.066
DIF: Moderate
REF: Section 2.2 **NAR:** Table 2.2

55. Considering all applicants, how many had a high school GPA below 3.0?
ANS: 1,119
DIF: Easy
REF: Section 2.2 **NAR:** Table 2.2

56. What percentage of all applicants had a high school GPA of 3.5 or greater?
ANS: 46.4

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DIF: Moderate
REF: Section 2.2 **NAR:** Table 2.2

57. What proportion of in-state students had a high school GPA of 3.75 or greater?
ANS: 0.201
DIF: Moderate
REF: Section2.2 **NAR:** Table 2.2

58. What proportion of out-of-state students had a high school GPA of 3.75 or greater?
ANS: 0.189
DIF: Moderate
REF: Section 2.2 **NAR:** Table 2.2

59. What proportion of all grades were "As"?
ANS: 0.303
DIF: Moderate
REF: Section 2.2 **NAR:** Table 2.2

60. What proportion of all grades were a "C" or better?
ANS: 0.886
DIF: Moderate
REF: Section 2.2 **NAR:** Table 2.2

61. What proportion of all grades were below a "C"?
ANS: 0.114
DIF: Moderate
REF: Section 2.2 **NAR:** Table 2.2

62. What percentage of students in lab courses earned a "B" or higher?
ANS: 57.8
DIF: Moderate
REF: Section 2.2 **NAR:** Table 2.2

63. What proportion of students in capstone courses earned a "C" or lower?
ANS: 0.376
DIF: Moderate
REF: Section 2.2 **NAR:** Table 2.2

64. What proportion of students in core courses earned a "B" or higher?
ANS: 0.624
DIF: Moderate

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