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Test 1 PSY2106F Oct 2010. Open books and written notes are fine to use, but no computers or communications devices. Simple calculators are fine.

Multiple Choice (1 point each)
Circle the choice that best answers the question. Use pen, not pencil.

____ 1. A variable that consists of indivisible categories with no other scores existing between neighboring categories is called a(n) ____ variable.
   a. independent
   b. dependent
   c. discrete
   d. continuous

____ 2. What frequency distribution graph is appropriate for scores measured on a nominal scale?
   a. only a histogram
   b. only a polygon
   c. either a histogram or a polygon
   d. only a bar graph

____ 3. A professor recorded the academic major for each student in an introductory psychology class. If the data are presented in a frequency distribution graph, what type of graph should be used?
   a. a bar graph
   b. a histogram
   c. a polygon
   d. either a histogram or a polygon

____ 4. The students in a psychology class seemed to think that the midterm exam was very easy. If they are correct, what is the most likely shape for the distribution of exam scores?
   a. symmetrical
   b. positively skewed
   c. negatively skewed
   d. normal

____ 5. In a normal shaped distribution, ____.
   a. the scores pile up in the middle and taper off symmetrically to both sides.
   b. the scores pile up on the right-hand side and taper off to the left.
   c. the scores pile up on the left-hand side and taper off to the right.
   d. the scores are evenly distributed across the entire scale of measurement.

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____ 6. A distribution is positively skewed. Which is the most probable order, from smallest to largest, for the three measures of central tendency?
   a. mean, median, mode
   b. mode, median, mean
   c. mean, mode, median
   d. median, mean, mode

____ 7. What value is obtained if you add all the deviation scores for a population, then divide the sum by N?
   a. the population variance
   b. the population standard deviation
   c. you always will get zero
   d. none of the other choices is correct

____ 8. What is the value of SS (sum of squared deviations) for the following sample?
   Sample: 1, 1, 1, 3

   a. 0
   b. 1
   c. 3
   d. 12

____ 9. A population of N = 100 scores has $\mu = 30$ and $\sigma = 4$. What is the population variance?
   a. 2
   b. 4
   c. 8
   d. 16

____ 10. A population of scores has $\mu = 50$ and $\sigma = 10$. If 5 points are added to every score in the population, then the new mean and standard deviation would be ____.
   a. $\mu = 50$ and $\sigma = 10$
   b. $\mu = 55$ and $\sigma = 10$
   c. $\mu = 50$ and $\sigma = 15$
   d. $\mu = 55$ and $\sigma = 15$

____ 11. What are the values for SS and variance for the following sample of n = 3 scores?
   Sample: 1, 4, 7

   a. SS = 18 and variance = 6
   b. SS = 18 and variance = 9
   c. SS = 66 and variance = 22
   d. SS = 66 and variance = 33

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____ 12. What are the values for SS and variance for the following sample of n = 4 scores?
Sample: 1, 1, 0, 4

a. SS = 9 and variance = 3
b. SS = 9 and variance = 2.25
c. SS = 18 and variance = 6
d. SS = 18 and variance = 9

____ 13. Which of the following is true for most distributions?
a. Around 30% of the scores will be located within one standard deviation of the mean.
b. Around 50% of the scores will be located within one standard deviation of the mean.
c. Around 70% of the scores will be located within one standard deviation of the mean.
d. Around 90% of the scores will be located within one standard deviation of the mean.

____ 14. What position in the distribution corresponds to a z-score of z = +2.00?
a. above the mean by 2 points
b. above the mean by a distance equal to 2 standard deviations
c. below the mean by 2 points
d. below the mean by a distance equal to 2 standard deviations

____ 15. Which of the following z-score values represents the location closest to the mean?
a. z = +0.50
b. z = +1.00
c. z = –1.00
d. z = –2.00

____ 16. Under what circumstances would a score that is located 5 points above the mean be considered relatively close to the mean?
a. when the population mean is much less than 5
b. when the population mean is much greater than 5
c. when the population standard deviation is much less than 5
d. when the population standard deviation is much greater than 5

____ 17. Suppose you earned a score of X = 54 on an exam. Which set of parameters would give you the highest grade?
a. $\mu = 50$ and $\sigma = 2$
b. $\mu = 50$ and $\sigma = 8$
c. $\mu = 52$ and $\sigma = 2$
d. $\mu = 52$ and $\sigma = 8$

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____ 18. What z-score value separates the top 70% of a normal distribution from the bottom 30%?

a. $z = 0.52$
b. $z = 0.84$
c. $z = -0.52$
d. $z = -0.84$

____ 19. A normal distribution has a mean of $\mu = 70$ with $\sigma = 12$. If one score is randomly selected from this distribution, what is the probability that the score will be greater than $X = 79$?

a. 0.7734
b. 0.2266
c. 0.2734
d. 0.3085

____ 20. A normal distribution has a mean of $\mu = 80$ with $\sigma = 20$. What score separates the highest 40% of the distribution from the rest of the scores?

a. $X = 75$
b. $X = 85$
c. $X = 54.4$
d. $X = 105.6$

Short answer (2 points each)

21. Explain why it is necessary to have more than one standard procedure for defining and measuring central tendency.

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22. For the following sample of scores:

    Scores: 1, 1, 2, 2, 2, 2, 4

    a. Find the mean, median, and mode.
    b. If a new individual with a score of X = 2 is added to the sample, what happens to the values for the mean, the median, and the mode?
    c. If the score X = 4 in the original distribution is changed to X = 11, what happens to the values for the mean, the median, and the mode?

23. Calculate the variance and the standard deviation for the following sample data.

    Scores: 10, 7, 9, 1, 2, 0, 6

24. For a population with $\mu = 60$ and $\sigma = 12$, find the z-score corresponding to each of the following X values:

    66, 78, 57, 48

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25. For a normal distribution,
    a. What z-score separates the highest 10% from the rest of the scores?
    b. What z-score separates the highest 30% from the rest of the scores?
    c. What z-score separates the lowest 40% from the rest of the scores?
    d. What z-score separates the lowest 20% from the rest of the scores?

26. The PSY2106F class contains 52 female and 4 male students. If you choose one student at random, what is the probability that the student will be male? If you choose two students at random, what is the probability that both of them will be male?

27. Dams and drainage channels are typically built to withstand "hundred year floods", that is, to withstand flood levels that occur on average once in every 100 years. In 2011, if the Carp River experienced a hundred year flood, what is the probability that another one would occur in 2012?

28. The PSY2106F class contains 52 females and 4 males. The probability of this occurring by chance is about 1 in 5 million: very low. What does this low probability tell you about why this might have happened?

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Answer Section

MULTIPLE CHOICE

1.	ANS: C	PTS: 1	REF: p. 19	TOP: Section 1.4			
2.	ANS: D	PTS: 1	REF: p. 45	TOP: Section 2.3			
3.	ANS: A	PTS: 1	REF: p. 45	TOP: Section 2.3			
	MSC: www						
4.	ANS: C	PTS: 1	REF: p. 50	TOP: Section 2.4			
	MSC: www						
5.	ANS: A	PTS: 1	REF: p. 47	TOP: Section 2.3			
6.	ANS: B	PTS: 1	REF: p. 82	TOP: Section 3.6			
7.	ANS: C	PTS: 1	REF: p. 92	TOP: Section 4.3			
8.	ANS: C	PTS: 1	REF: p. 100	TOP: Section 4.4			
9.	ANS: D	PTS: 1	REF: p. 97	TOP: Section 4.3			
10.	ANS: B	PTS: 1	REF: p. 107	TOP: Section 4.5			
	MSC: www						
11.	ANS: B	PTS: 1	REF: p. 100	TOP: Section 4.3			
	MSC: www						
12.	ANS: A	PTS: 1	REF: p. 100	TOP: Section 4.3			
	MSC: www						
13.	ANS: C	PTS: 1	REF: p. 106	TOP: Section 4.5			
14.	ANS: B	PTS: 1	REF: p. 123	TOP: Section 5.2			
	MSC: www						
15.	ANS: A	PTS: 1	REF: p. 123	TOP: Section 5.2			
16.	ANS: C	PTS: 1	REF: p. 123	TOP: Section 5.2			
17.	ANS: A	PTS: 1	REF: p. 123	TOP: Section 5.2			
	MSC: www						
18.	ANS: C	PTS: 1	REF: p. 156	TOP: Section 6.2			
	MSC: www						
19.	ANS: B	PTS: 1	REF: p. 159	TOP: Section 6.3			
	MSC: www						
20.	ANS: B	PTS: 1	REF: p. 162	TOP: Section 6.3			

OTHER

21. ANS:
No single method for measuring central tendency will produce a good, representative value in every situation. Although the mean works well in most situations, there are circumstances in which the mean is not representative or the mean cannot be calculated.

PTS: 1

22. ANS:

a. The mean, median, and mode are all equal to 2. (The precise mode is 1.875.)
b. Adding a score of X = 2 does not change the mean, the median, or the mode.
c. Changing X = 4 to X = 11 causes the mean to change to M = 3. The median and the mode are still equal to 2.

PTS: 1

23. ANS:
SS = 96; $s^2 = 16$; s = 4

PTS: 1

24. ANS:
z = +0.50 (above the mean by $^1/_2$ standard deviation)
z = +1.50 (above the mean by 1 $^1/_2$ standard deviations)
z = –0.25 (below the mean by $^1/_4$ standard deviation)
z = –1.00 (below the mean by 1 standard deviation)

PTS: 1 MSC: www

25. ANS:

a. z = 1.28
b. z = 0.52
c. z = –0.25
d. z = –0.84

PTS: 1

26. ANS:
p (male_ = 4/52 = 1/13 = 0.077
p (male) twice in a row = (4/52)*(4/52) = 16/2704 =.006

PTS: 1

27. ANS:
1/100.

PTS: 1

28. ANS:
Nothing.

PTS: 1

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[Answer Strip]

B 6. A 12. C 18.

C 1. C 7. B 19.
C 13.

D 2. C 8.
B 14. B 20.

A 3. A 15.
D 9.

C 4. B 10. C 16.

A 5. B 11. A 17.