

Psychology 310
Diagnostic Practice Exam – Form B

Student Name: _____

Instructions: Answer all questions by circling the correct answer on the test paper. There is no penalty for guessing. If you believe that an item is incorrect, or has more than one correct answer, indicate your reasoning on the test paper with a brief note. This exam is open book, open note, and calculators may be used. Computers may not be used. **Time Limit 70 minutes.**

- 1 Compute the sample mean \bar{X} for the following 5 numbers: 2, 4, 5, 5, 5
 - (a) 2.1
 - (b) 4.40
 - (c) 4.2
 - (d) 3.36
 - (e) None of the above are correct

- 2 Compute the sample variance S^2 for the following 5 numbers: 4, 2, 2, 1, 4
 - (a) 2.0
 - (b) 1.8
 - (c) 1.60
 - (d) 1.44
 - (e) None of the above answers are correct

- 3 Suppose you have 10 numbers and have computed the mean to be 8.0. You then discover that the last number in the data was entered incorrectly. It was entered as 2.0 when it should have been 3.0. If you replace the incorrect value (2.0) with the correct one (3.0), and recompute the mean, you will obtain a new mean of
 - (a) 8.1
 - (b) 9.1
 - (c) 7.1
 - (d) It is impossible to determine

- 4 You have 4 numbers, a, b, c, d . If you multiply them all by 4, the mean of the resulting data set will be
 - (a) $4(a + b + c + d)$
 - (b) $a + b + c + d$
 - (c) $16(a + b + c + d)$
 - (d) $(a + b + c + d)/4$

5 Consider the following data array

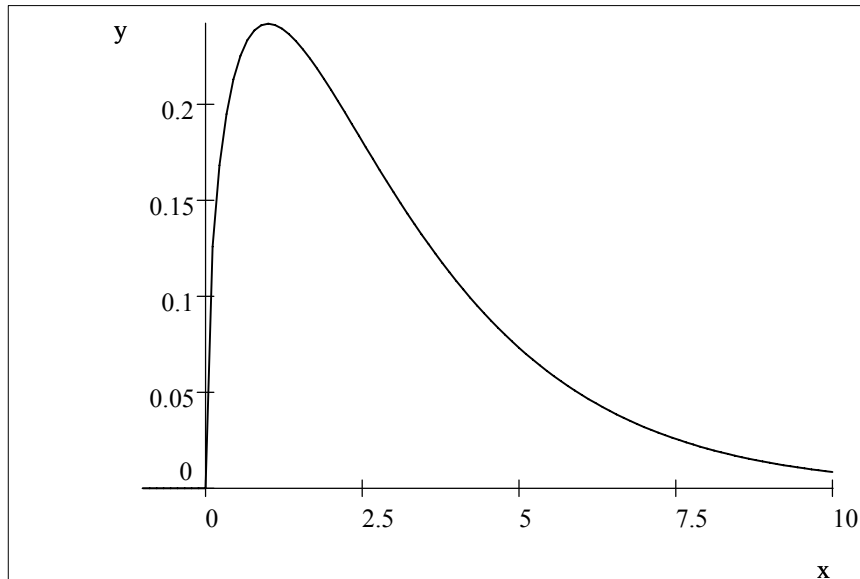
4 3 1 2
4 9 9 7
5 7 12 1
4 7 6 1

Compute

$$\sum_{i=2}^3 \sum_{j=1}^3 X_{ij}$$

- (a) 46
 - (b) 45
 - (c) 38
 - (d) 51
 - (e) None of the above.
- 6 You have the following set of data: 1,5,3,7,8. Find the median
- (a) 5
 - (b) 3
 - (c) 4
 - (d) 7
- 7 Which of the following is *not* true of the median
- (a) It is the middle value in a distribution
 - (b) The value for combined groups cannot be determined from the sample sizes and group values of the individual groups
 - (c) It is sensitive to outliers
 - (d) Multiplying all values by 5 multiplies the median by 5.
- 8 Widgets are weighed on a scale that is accurate to the nearest 100 grams. A group of 50 widgets is weighed. The heaviest widget is recorded as 9000 grams, the lightest at 4000 grams. The inclusive range is the difference between the upper real limit and lower real limit for the data. What is the *inclusive range* for these data?
- (a) 5100
 - (b) 5200
 - (c) 5001
 - (d) 5050

9 The probability distribution shown below is



- (a) Symmetric and Unimodal
- (b) None of the above answers are correct
- (c) Positively Skewed
- (d) Negatively Skewed
- (e) Symmetric and Bimodal

10 For the following data array, compute $\bar{X}_{.3}$

7	3	1	2
7	3	3	10
5	2	21	4
4	4	6	1

- (a) 6.75
- (b) 7.75
- (c) 10.33
- (d) 5.813

11 For the following data, compute \bar{X} .

4	3	1	2
4	3	3	7
5	2	12	1
4	4	6	1

- (a) 61
- (b) 60
- (c) 3.875
- (d) 15.5
- (e) 62

12 For the following frequency distribution of number of children for psychology faculty members at a major Eastern institution

X	f
3	3
2	5
1	3
0	8

Compute the sample mean

- (a) 2.158
- (b) 0.9579
- (c) 4.4
- (d) 1.158

13 Group A is composed of a sample of 20 observations, and has a sample mean of 5 and a sample variance of 30. Group B is composed of a sample of 20 observations, and has a sample mean of 7 and a sample variance of 20. If A and B are combined to form one large group, what will be the variance of this combined group?

- (a) 33.03
- (b) 5.038
- (c) 30.46
- (d) 25.38
- (e) None of the above answers are correct

- 14 Jamal took an exam where the class mean was $\bar{X} = 71$ and the class standard deviation was $S = 11$. What Z -score must Jamal exceed to have a grade that exceeds 80?
- (a) 1.206
 - (b) 0.8182
 - (c) 0.7182
 - (d) 1.318
 - (e) None of the above answers are correct.

- 15 In the frequency distribution below, what is the *cumulative relative frequency* or *cumulative proportion of cases* at or below the value $X = 1$?

X	f
3	7
2	7
1	7
0	4

- (a) 0.83
 - (b) 0.16
 - (c) 0.72
 - (d) 0.44
 - (e) None of the above answers are correct
- 16 In a normal distribution with a mean of 52 and a standard deviation of 15, which of the following scores is at the 25th percentile?
- (a) 53.44
 - (b) 41.88
 - (c) 39.37
 - (d) 51.88
 - (e) None of the above answers are correct
- 17 IQ scores have a distribution that is approximately normal in shape, with a mean of 100 and a standard deviation of 15. What percentage of scores is at or above an IQ of 132?
- (a) 1.645
 - (b) 1.809
 - (c) 1.88
 - (d) 1.433
 - (e) None of the above answers are correct

- 18** Group A has a mean of 0 and a standard deviation of 1. Group B has a mean of 0 and a standard deviation of 1. 1.
The populations have a normal distribution. Consider the proportion of scores at or above 2.7 in Group B, and the proportion of scores at or above 2.7 for Group A? What is the ratio of these proportions?
- (a) 1.017
 - (b) 2.034
 - (c) 2.441
 - (d) 2.848
- 19** You have a set of 11 numbers with a mean of 23. If you add an additional number to the original group, and that new number has a value of 28, what will be the mean of the new set of 12 numbers?
- (a) 25.76
 - (b) 23.42
 - (c) 28.1
 - (d) 16.39
 - (e) None of the above answers are correct.
- 20** IQ scores have a distribution that is approximately normal in shape, with a mean of 100 and a standard deviation of 15 in the general population. Assuming a normal distribution is a good approximation, what proportion of the general population has IQ scores between 78.0 and 109.0?
- (a) 0.7200
 - (b) 0.5545
 - (c) 0.6545
 - (d) 0.7545
 - (e) None of the above answers are correct
- 21** You have 10 numbers with a mean of 20.0. You first add 5.0 to all the numbers, *then* divide them all by 3.0. What will the mean of the numbers be when you are finished?
- (a) 8.333
 - (b) 8.433
 - (c) 11.67
 - (d) 8.233
 - (e) None of the above answers are correct

- 22 You have a set of positive numbers that are at the ratio level of measurement. If you add 5 to them all, what level of measurement will the new numbers achieve
- (a) Interval
 - (b) Ratio
 - (c) Nominal
 - (d) Ordinal
- 23 You have an old-fashioned stopwatch with a "reset" button that pushes the second hand back to zero. However, the cam on the button is broken, so it actually resets to 0.3 seconds instead of zero. If you measure time with this stopwatch (assuming that otherwise it runs accurately), what level of measurement will your times achieve?
- (a) Ordinal
 - (b) Nominal
 - (c) Interval
 - (d) Ratio
- 24 The mean is that point in a distribution to which
- (a) The sum of cubed distances is a minimum
 - (b) The sum of signed distances is a minimum
 - (c) The sum of absolute distances is a minimum
 - (d) The sum of squared distances is a minimum
- 25 Suppose you take a sample of size 500 from a population with a normal distribution and a standard deviation of $\sigma = 20$. You then compute the range (i.e., difference between the highest and lowest value) for your sample. In the long run, you would expect the range in such situations to average out to a value of ?
- (a) 61
 - (b) 109.8
 - (c) 134.2
 - (d) 122.0
- 26 In a group 83 numbers, the sum of cubed z -scores, $\sum_{i=1}^N z_i^3$, is equal to 57. In this case, the coefficient of skewness, γ_1 , is equal to
- (a) 1.373
 - (b) 0.7554
 - (c) 0.6867
 - (d) 0.1373

27 If you have a group of 57 numbers, you know in advance (without knowing any of the actual values of the numbers) that the largest possible z -score value is

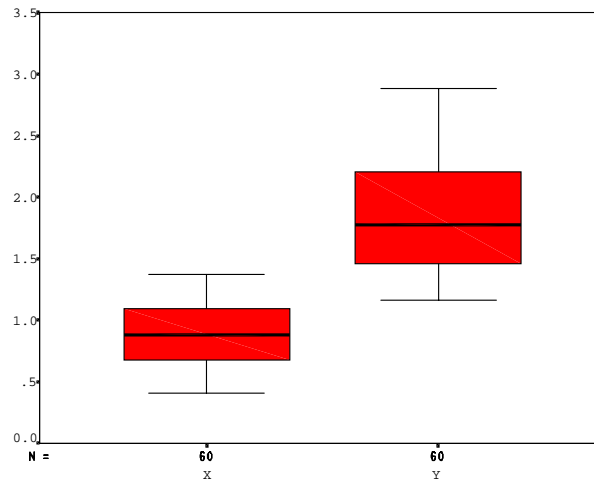
- (a) 7.550
- (b) 8.159
- (c) 5.786
- (d) 7.417

28 Given the following grouped frequency distribution, estimate the median, using Equation 4.1 from Glass & Hopkins.

X	f
3	6
2	7
1	19
0	8

- (a) 1.632
- (b) 1.132
- (c) 1.018
- (d) 1.516

29 Based on the two boxplots shown below, which of the following statements is *true*.



- (a) X has a lower median than Y
- (b) X has more variability than Y
- (c) X has a higher interquartile range than Y
- (d) X is less symmetric than Y

30 In a group of 50 scores, the sum of 4th powers of z -scores is

$$\sum_{i=1}^N z_i^4 = 200.0$$

In this case, the coefficient of kurtosis γ_2 is equal to _____, and the distribution of scores is _____

- (a) 4.0 ; platykurtic
- (b) 4.0 ; leptokurtic
- (c) 1.0 ; leptokurtic
- (d) 1.0 ; platykurtic