1. **Don’t even open this until you are told to do so.**

2. Please PRINT your name in the blanks provided.

3. There are 20 multiple-choice questions on this exam, each worth 5 points. There is partial credit. Please mark your answers clearly. Multiple marks will be counted wrong.

4. You will have 60 minutes to finish this exam.

5. If you have questions, please write out what you are thinking on the back of the page so that we can discuss it after I return it to you.

6. If you are caught cheating or helping someone to cheat on this exam, you both will receive a grade of zero on the exam. You must work alone.

7. This exam is worth the same as a regular exam (this may differ from section to section).

8. Good luck!
1. Which of the following is true?
   A. You can calculate both the mean and median from a stemplot.
   B. You can calculate both the mean and median from a histogram.
   C. You can estimate both the mean and median from a boxplot.
   D. All of the above are true.
   E. Only two of the above are true.

2. How would you describe the correlation in the plot above?
   A. strongly negative
   B. moderately negative
   C. weak
   D. moderately positive
   E. strongly positive

3. The data in the scatterplot is the literacy rates (percents) for men and women in Islamic nations. Which of the following is true?
   A. The literacy rate for men must be higher than for women because the slope is positive.
   B. On average, as the literacy rate for men increases so does the rate for women.
   C. Adding a country with a men’s rate of 75% and a women’s of 50% would not change the relationship \( (b_0, b_1 \text{ and } r \text{ would stay about the same}) \).
   D. All of the above are true.
   E. Only two of the above are true.

4. Which of the following is true for the same scatterplot?
   A. Adding a country with a women’s literacy rate higher than the men’s would be an outlier.
   B. Adding a country with a both men’s and women’s literacy rate below 50% would be an outlier.
   C. Adding a country at the point (80,50) would definitely be an influential point.
   D. This same relationship can be used to predict the women’s literacy rate in other countries, not just Islamic nations.
   E. All of the above are true.

The College of Science is looking at the retention of their students. One point of interest is which of their majors transferred to which other departments. The table below contains some of this information.

<table>
<thead>
<tr>
<th>Transferred to Major</th>
<th>Eng Mgmt LibArt</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biol</td>
<td>13 25 158</td>
<td>196</td>
</tr>
<tr>
<td>Chem</td>
<td>16 15 19</td>
<td>50</td>
</tr>
<tr>
<td>Math</td>
<td>3 11 20</td>
<td>34</td>
</tr>
<tr>
<td>Phys</td>
<td>9 5 14</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>41 56 211</td>
<td>308</td>
</tr>
</tbody>
</table>

5. From this table, how likely is a math major to transfer to Liberal Arts?
   A. 34/308
   B. 20/308
   C. 20/34
   D. 20/211
   E. 211/308

6. Which of the following is/are true?
   A. 34/308 is a marginal probability.
   B. 41/196 is a marginal probability.
   C. 15/50 is a conditional probability, conditioning on the ‘Transferred to major’.
   D. All of the above are true.
   E. Only two of the above are true.

7. What is the best definition of the probability 9/28?
   A. It is the probability of being a physics major and transferring to engineering.
   B. It is the probability of transferring to engineering assuming you were a physics major.
   C. It is the probability that a physics major transferred to engineering.
   D. It is the probability that an engineer started out as a physics major.
   E. It is the proportion of engineers that came from physics.
8. Suppose the average on the first exam in STAT302 is 82 with a standard deviation of 13 and the average on the first exam in STAT303 is 74 with standard deviation of 9. If Joe made a 75 on the 302 exam and Jane made a 70 on the 303 exam, which of the following is true.

A. Jane did relatively better.
B. Joe did relatively better.
C. We can’t determine who did better since the data is obviously not normal.
D. They did relatively the same.
E. Jane because everyone knows 303 is harder.

9. An article in “Parenting” magazine (Dec/Jan 2004) claims that 60% of all Americans say that they need a vacation after visiting family for the holidays. A simple random sample taken of 150 Americans reported that 50% said that they needed a vacation after visiting family. Which of the following is true?

A. 60% is a statistic and 50% is a parameter
B. 50% is a statistic and 60% is a parameter
C. 50 and 60% are both statistics
D. 50 and 60% are both parameters
E. None of the above are correct.

10. What can be said about the two boxplots above assuming there are as many males and females represented?

A. The standard deviation for females is larger than that of males.
B. The IQR is larger for females.
C. The mean is larger for males.
D. All of the above are true.
E. Only two of the above are true.

11. Which of the following is most likely the 5 Number Summary for the boxplot labelled Female?

A. 30, 60, 70, 80, 100
B. 40, 60, 70, 80, 100
C. 25, 60, 75, 85, 100
D. 28, 60, 70, 85, 100
E. This cannot be determined from the boxplot.

12. If you have a dataset with mean 12 and standard deviation 4, which of the following would be true?

A. about 68% of the data would be between 8 and 16
B. about 95% of the data would be between 6 and 18
C. almost all of the data would be between 0 and 24
D. Two of the above are true.
E. None of the above have to be true.

13. Which of the following is true?

A. As long as you take random samples, your sample statistics are unbiased.
B. Sampling from a larger population gives you less variable statistics.
C. Simple random samples of a size n are all just as likely to occur.
D. All of the above are true.
E. None of the above are true.

14. What feature(s) of a dataset does a boxplot display?

A. the mean and the standard deviation
B. the 5 Number Summary: minimum, Q1, ˆx, Q3, maximum
C. whether the data is symmetric or skewed
D. All of the above are displayed in a boxplot.
E. Exactly two of the above are displayed in a boxplot (excluding D.).

15. Suppose you have a dataset of 100 points that is bell-shaped with a mean of 45 and a standard deviation of 8. Which of the following is true?

A. The range of the data should be about 48.
B. The IQR should be about 11.
C. The 3rd percentile should be a little more than 29.
D. All of the above are correct.
E. Only two of the above are correct.
16. Suppose data was collected from statistics students regarding the length of time they studied for an exam, \( x \), and their grade on the exam, \( y \). The data contained scores for students that studied anywhere from 0 to 8 hours. From StataQuest, we find that the prediction (regression) equation is \( \hat{y} = 22 + 10x \) and the correlation coefficient, \( r = 0.74 \). What would be the expected increase in their exam grade if a student studied \textit{one additional} hour?

A. 22 points  
B. 10 points  
C. 74 points  
D. 0.74 point  
E. 32 points

17. Which of the following best describes the distribution above?

A. The data is skewed to the right.  
B. The data is skewed to the left.  
C. The data is almost symmetric. 
D. The shape can’t be determined.  
E. Shape is not a valid description for this data.

A. The \textit{larger} the slope, \( b_1 \), in the equation, \( \hat{y} = b_0 + b_1x \), the stronger the linear relationship between \( x \) and \( y \).  
B. If we multiply all the \( y \)'s by 10, both the slope, \( b_1 \), and intercept, \( b_0 \), will be 10 times bigger.  
C. A change of scale on \( x \) will cause a change in the intercept, \( b_0 \), in the equation, \( \hat{y} = b_0 + b_1x \).  
D. All of the above are true statements.  
E. All of the above are false statements.

19. The average salary of all female workers is $35,000. The average salary of all male workers is $41,000. What must be true about the average salary of all workers?

A. It must be $38,000.  
B. It must be larger than the median salary.  
C. It could be any number between $35,000 and $41,000.  
D. It must be larger than $38,000.  
E. It’s impossible to tell without knowing how many males and females there are.

20. If you have normal data, then

A. the normal quantile plot will be bell-shaped.  
B. the mean, median and mode will all be equal.  
C. the maximum value should be no more than 4.  
D. All of the above are true statements.  
E. None of the above are true statements.