Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ECON/ACCT/BUSA 222—Bethany College

**Exam 01**

* There are 110 possible points on this exam. The test is out of 100.
* You have two hours to complete this exam, but you should be able to complete it in less than that
* Please turn off all cell phones and other electronic equipment.
* You are allowed a calculator for the exam. This calculator cannot be capable of storing equations. This calculator cannot double as a cell phone.
* Be sure to read all instructions and questions carefully.
* Remember to show all your work.
* Recall basic logic. “Water is wet” is a true statement. “Water is wet and leopards have stripes” is a false statement.
* You are allowed one 3” by 5” note card with the exam. You are allowed any information you deem important on it.
* *Please print clearly and neatly.*

**Part I: Multiple Choice.** *Choose the best answer to the following.*

4 points each.

1. What was the Stanford Prison Experiment?
   1. When the Stanford University administration experimented with supplementing their income by converting some dorms into prison cells.
   2. A famous experiment which demonstrated the importance of standard deviation.
   3. An experiment which demonstrated the importance of strict ethics rules.
   4. B & C
   5. None of the above
2. Suppose you had some data concerning daily oil production (in gallons) for 500 different wells in the United States. If you wanted to get an idea for the distribution of production (including if there are multiple modes), which data display would be most appropriate?
   1. Dot plot
   2. Histogram
   3. Stem-and-leaf
   4. Box plot
   5. None of the above
3. What is a major disadvantage to using the median to describe data?
   1. It’s disproportionately influenced by large outliers
   2. If an increase in the sample shares a similar value, it may not change
   3. It has difficulty describing continuous variables
   4. B & C
   5. None of the above
4. If the growth rate in one year is 6% and the growth rate in the following year is 2%, about what is the geometric mean?
5. 1.04%
6. 3.46%
7. 3.98%
8. 4.00%
9. None of the above
10. Which of the following is a normative statement?
    1. “I suspect the turn we need to make should be coming up soon.”
    2. “The more you tax people, the less incentive they have to work.”
    3. “The best policy for America right now is to remove immigration barriers.”
    4. A & C
    5. None of the above
11. Astrophysicist Neil deGrasse Tyson argues in favor of increasing NASA’s budget because it does valuable things and its budget only consumes half a penny for every taxpayer dollar. Assume he is correct about the size of the budget but his argument is flawed. How would one describe the error or Dr. Tyson’s argument?
12. It is sound but not valid
13. It is valid but not sound
14. It is neither valid nor sound
15. It is both valid and sound
16. None of the above
17. Which of the following is an example of a pair of variables that are likely positively correlated?
18. Insurance premiums and accidents
19. Income and spending
20. Weight and level of exercise
21. A & B
22. None of the above
23. Which of the following have a normal distribution with zero skewness?
    1. The result of die roll
    2. Income
    3. Height
    4. A & C
    5. None of the above
24. What is the difference between a set of panel data and a time series?
    1. Panel data tends to be larger
    2. The data of a time series is continuous
    3. Panel data aren’t made up of cross-sectionals
    4. A & C
    5. None of the above
25. The percent of families who own their own home is positively correlated with average income across different U.S. states. Suppose a governor attempts to increase average income by subsidizing homeownership. If this is a mistake, what is the most likely reason?
    1. Reverse causation: home ownership is the result of high incomes.
    2. Reverse causation: something else is causing both variables.
    3. Confounding variable: home ownership is the result of high incomes.
    4. Confounding variable: something else is causing both variables.
    5. None of the above / The governor has the correct interpretation
26. Which of the following is a weakness of presenting data in a pie chart?
    1. It is intuitively difficult to tell what the chart represents
    2. People have trouble interpreting round objects
    3. It’s hard to tell which section is largest
    4. A & C
    5. None of the above
27. Suppose time spent playing video games and non-violent criminal activity are negatively correlated. While there might be a causation story (video games offer a safe outlet for criminal urges), a confounding variable could also be an explanation. Which of the following is the most likely confounding variable?
    1. Frequency of police patrols
    2. Frequency of new video game releases
    3. Weather
    4. A & B
    5. None of the above

**Part II: True/False.** *Answer true or false, and justify your answer.*

10 points each.

1. An example of inductive reasoning would be “According to Jerry, he was at Mallory’s Bakery at 10:55 AM and then walked to Tuba St, arriving five minutes later. Since the only way to get to Tuba St. from Mallory’s that quickly is to cross the Jenkins Bridge, he must have crossed that bridge. Or he’s lying. ”

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1. It takes five and only five numbers to construct a box-and-whisker plot.

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1. If the kurtosis value of a data set is negative, the distribution skews to the right.

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**Part III: Short Answer.** *Answer the following.* 16 points each.

1. Sam grows potatoes and he’s curious if his crop is infected with a disease. He knows nationally, 1% of crops have the disease. His test is 90% sensitive and 98% specific. If the crop tests positive, what is the likelihood the crop has the disease?
2. Suppose you do a taste test of a new fruit drink and people rate the drink on a scale of one to four. One means the new drink was much worse than a pre-existing drink they had, two means it was slightly worse, three means it was slightly better, and four means it was much better. Below is the data from the survey. Calculate the standard deviation.

|  |  |
| --- | --- |
| *Score* | *Number of people who indicated that score* |
| 1 | 40 |
| 2 | 80 |
| 3 | 60 |
| 4 | 20 |