Directions:
• Print your NAME on THIS EXAM.

• Print your NAME on your SCANTRON.

• Write FORM B on your SCANTRON.

• Put your Photo ID on your desk.

• Each question has exactly one BEST answer. There are 21 questions. Two questions are free response - be sure to write your answer on the exam.

• You may write on this exam. There is no scratch paper allowed.

• Each question is worth 5 points for a total of 105 points. This includes 5 bonus points!

• If you have no note page, you must write NO NOTES on your SCANTRON.

• When you are finished, put your SCANTRON and PAGE of NOTES inside this EXAM. Before you start packing up your things, turn in your EXAM, NOTES and SCANTRON. Then go back to your desk to pack up your materials. When your exam is returned, you will get back all materials you turned in.

• Turn your cell phone OFF. Any noise from a cell phone will signal that your exam is over.

• FAILURE TO FOLLOW ALL INSTRUCTIONS WILL COST YOU THE 5 BONUS POINTS!
1. Interpret the box plot:

   - There is more data in the interval 12 - 16 than in the interval 10 - 12.
   - The interval 8.5 - 10 contains more data than the interval 17 - 19.
   - The second quartile is 10.
   - The data is skewed to the left.

2. At the end of Spring Quarter, Khoa took 3 final exams. His exam scores are summarized in the following table, along with the summary statistics for all students taking the exams.

<table>
<thead>
<tr>
<th>Final Exam</th>
<th>Khoa’s Grade</th>
<th>Class Average</th>
<th>Class Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yoga Final Exam</td>
<td>4</td>
<td>2.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Statistics Final Exam</td>
<td>85</td>
<td>73</td>
<td>10</td>
</tr>
<tr>
<td>History Final Exam</td>
<td>165</td>
<td>147</td>
<td>22</td>
</tr>
</tbody>
</table>

On which final exam did he perform best compared to the other students taking the same exam?

   - Yoga Final Exam
   - Statistics Final Exam
   - History Final Exam
   - Unable to determine because we do not have all other students’ data

Questions 3 - 4 refer to the following:

A De Anza College Math 10 instructor is interested in the average grade on the first exam of Math 10 students during Summer 2015. After the first exam, she conducts a survey consisting of 5 randomly chosen students from each De Anza College Summer 2015 section of Math 10.

3. What is the population she is interested in?

   - All De Anza College students
   - All De Anza College Summer 2015 Math students
   - All De Anza College students in her Math 10 classes
   - All De Anza College Summer 2015 Math 10 students

4. Her sample mean is 72.5. This value is an example of:

   - Parameter
   - Data
   - Statistic
   - Variable
5. Each of the 30 National Hockey League teams has 23 players. Two random samples are constructed as described below:

**Sample I**: A sample of 69 players is to be chosen as follows. The name of each team will be written on a card and 3 team names will be randomly drawn out. The sample will consist of all the players from each of the selected teams.

**Sample II**: A sample of 60 players is to be chosen as follows. Each team will be asked to place 23 cards with their players' names into a hat and randomly draw out two names. The two names from each team will be combined to make up the sample.

What types of sampling techniques are used for each sample?

A. Sample I uses Cluster; Sample II uses Stratified
B. Sample I uses Simple Random; Sample II uses Systematic
C. Sample I uses Systematic, Sample II uses Cluster
D. Sample I uses Stratified; Sample II uses Cluster

**Questions 6 - 9 refer to the following:**

An insurance company states that 10\% of all fire insurance claims are fraudulent. Suppose the company is correct. Out of 25 randomly selected claims, we are interested in the number of fraudulent fire insurance claims.

6. What is the variable?

A. The proportion of fraudulent fire insurance claims
B. The number of fraudulent fire insurance claims
C. The number of fire insurance claims
D. The average number of fraudulent fire insurance claims

7. What distribution should be used to model the number of fraudulent fire insurance claims from the sample of 25?

A. random
B. stratified
C. B(25, 10)
D. B(25, 0.10)

8. What is the probability that at least 5 of the 25 claims are fraudulent?

A. 0.9020
B. 0.0334
C. 0.0980
D. 0.2000

9. What are the mean and standard deviation for the number of fraudulent claims out of 25?

A. mean = 2.5, standard deviation = 1.5
B. mean = 2.5, standard deviation = 2.25
C. mean = 5, standard deviation = 1.5
D. mean = 5, standard deviation = 2.25
Questions 10 - 15 refer to the following:
Forty De Anza College students were asked how many courses they were taking during Summer 2015. The results are shown below:

<table>
<thead>
<tr>
<th># of courses</th>
<th>Frequency</th>
<th>Relative Frequency</th>
<th>Cumulative Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
<td>0.20</td>
<td>0.20</td>
</tr>
<tr>
<td>2</td>
<td>18</td>
<td>0.45</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>0.10</td>
<td></td>
</tr>
</tbody>
</table>

10. What percent of students are taking at most 2 courses?
A. 45%  B. 65%  C. 50%  D. 55%

11. What type of data is this?
A. Qualitative  
B. Quantitative Continuous  
C. Quantitative Discrete  
D. Random

12. The interquartile range for this data is:
A. 2.5  B. 2  C. 1.5  D. 1

13. The sample mean and sample standard deviation for this data is:
A. Sample mean: 2.25 sample standard deviation: 0.8874  
B. Sample mean: 2.5 sample standard deviation: 0.8874  
C. Sample mean: 2.5 sample standard deviation: 0.8987  
D. Sample mean: 2.25 sample standard deviation: 0.8987

14. In the space below, use a complete sentence to interpret the 65th percentile. Your answer must include the value of the 65th percentile. [Leave your scantron blank for this answer]

15. In the space below, show your work to find the number that is 1.5 standard deviations below the mean (give answer to 4 decimal places) [Leave your scantron blank for this answer]
16. A game involves rolling a 6-sided die. On a roll of 1 or 6 you win $1. On a roll of 2, 3 or 4, you lose $2. On a roll of 5 you win $5. Over the long term of playing this game over and over, what are your average expected earnings per game?

A. Win $0.17  
B. Lose $0.17  
C. Win $1  
D. Lose $1

17: The population of the USA is 49.3% male and 50.7% female. 15.1% of females smoke and 17.9% of males smoke. Find the probability that a randomly selected person is a smoker. [Source: United Nations Economic Commission for Europe]

A. 0.3300  
B. 0.1648  
C. 0.1652  
D. 0.1650

Questions 18 - 20 refer to the following:

The following table shows the preferred snack of a sample of students by gender.

<table>
<thead>
<tr>
<th></th>
<th>candy</th>
<th>chips</th>
<th>carrots</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>male</td>
<td>9</td>
<td>2</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>female</td>
<td>5</td>
<td>9</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>33</td>
</tr>
</tbody>
</table>

18. What is the probability a randomly selected student from the sample will prefer carrots or be female?

A. 22 / 33  
B. 25 / 33  
C. 3 / 33  
D. 3 / 17

19. What is the probability randomly selected student from the sample will be male, given that the student prefers carrots?

A. 5 / 33  
B. 8 / 33  
C. 5 / 16  
D. 5 / 8

20. What can we say about the events “prefers chips” and “male”?

A. They are independent but not mutually exclusive  
B. They are not independent and are mutually exclusive  
C. They are neither independent nor mutually exclusive  
D. They are both independent and mutually exclusive.

21. For the following data set, which of the measures of central tendency would be the LEAST useful when describing the center of the data?

Data: 100, 400, 450, 450, 450, 1100, 1100, 1100, 1100, 35000000

A. Mean  
B. Median  
C. Mode  
D. Interquartile Range