Solve the following multiple-choice problems and write the answers (using a pen) on a separate sheet. Write your name on the sheet. (Each problem is worth 2 points)

1. A survey of executives revealed that 35% of them read Time magazine, 20% read Newsweek and 30% read U.S. News. Fifteen percent read both Time and U.S. News. What is the probability that a particular executive reads either Time or U.S. News?
   (a) 0.40
   (b) 0.50
   (c) 0.65
   (d) 0.80

2. A board of directors consists of 8 men and 4 women. A four-member committee is to be chosen at random to recommend a new company president. What is the probability that all four members of the search committee will be men?
   (a) 0.08
   (b) 0.14
   (c) 0.42
   (d) 0.67

3. A builder has standardized two interior plans that can be incorporated in any of the six exteriors. How many different ways can the exterior and interior plans be offered to potential homebuyers?
   (a) 12
   (b) 15
   (c) 30
   (d) 240

4. In a management trainee program, 60 percent of the trainees are female, 40 percent male. Ninety percent of the females attended college, 80 percent of the males attended college. A management trainee is selected at random. What is the probability that the person selected is a male who did NOT attend college?
   (a) 0.08
   (b) 0.12
   (c) 0.20
   (d) 0.32

5. When are two events mutually exclusive then:
   (a) The occurrence of one event increases the probability of the other event occurring
   (b) The occurrence of one event decreases the probability of the other event occurring
   (c) If one event occurs, then the other cannot occur
   (d) They overlap on a Venn diagram
Each salesperson in a large department store chain is rated with respect to sales potential for advancement. These traits for the 500 salespeople were cross-classified into the following table. Use this information to solve problems 6 and 7.

<table>
<thead>
<tr>
<th>Sales Ability</th>
<th>Fair</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below average</td>
<td>16</td>
<td>12</td>
<td>22</td>
</tr>
<tr>
<td>Average</td>
<td>45</td>
<td>60</td>
<td>45</td>
</tr>
<tr>
<td>Above average</td>
<td>93</td>
<td>72</td>
<td>135</td>
</tr>
</tbody>
</table>

6. What is the probability that a salesperson selected at random has “average” sales ability and a “good” potential for advancement?
(a) 0.60  
(b) 0.40  
(c) 0.24  
(d) 0.12

7. What is the probability that a salesperson selected at random will have “excellent” potential for advancement conditional on the fact that the individual has “above average” ability?
(a) 0.27  
(b) 0.30  
(c) 0.45  
(d) 0.67

8. Jerry calculates the probability of throwing an odd number on a die twice in a row. What type of approach is Jerry using?
(a) Classical approach  
(b) Empirical approach  
(c) Subjective approach  
(d) Inferential approach

9. Each team plays every other team once in a conference with 10 teams. How many games would the conference commissioner have to schedule each year?
(a) 45  
(b) 54  
(c) 90  
(d) 100

10. Judging from recent experience, 10% of the computer keyboards produced by an automatic, high-speed machine are defective. What is the probability that out of four keyboards selected at random, exactly one keyboards will be defective?
(a) .042  
(b) .112  
(c) .243  
(d) .292
11. Sixty percent of the customers of a fast food chain order a cheeseburger. If a random sample of 10 cash register receipts is selected, what is the probability that 7 or more will show that a cheeseburger was ordered?
(a) 0.215 
(b) 0.233 
(c) 0.382 
(d) 0.428 

12. Which of the following is correct about a probability distribution?
(a) Probability of each outcome must be between 0 and 1 inclusive 
(b) Sum of all possible outcomes must equal 1 
(c) Outcomes must be mutually exclusive 
(d) All of the above 

13. The variance of a binomial distribution is 12 and the probability of success is .50. How many trials does the distribution have?
(a) 4 
(b) 8 
(c) 24 
(d) 48 

A company is studying the number of monthly absences among its 125 employees. The following probability distribution shows the likelihood that people were absent 0, 1, 2, 3, 4, or 5 days last month. Use this to answer problems 14 and 15.

<table>
<thead>
<tr>
<th>Number of days absent</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.60</td>
</tr>
<tr>
<td>1</td>
<td>0.20</td>
</tr>
<tr>
<td>2</td>
<td>0.12</td>
</tr>
<tr>
<td>3</td>
<td>0.04</td>
</tr>
<tr>
<td>4</td>
<td>0.04</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

14. What is the mean number of days absent?
(a) 1.40 
(b) 0.72 
(c) 0.40 
(d) 2.20 

15. What is the variance of the number of days absent?
(a) 1.19 
(b) 1.99 
(c) 1.41 
(d) 5.42
16. An accelerated life test on a large number of type-D alkaline batteries revealed that the mean life for a particular use before they failed is 21.0 hours. The distribution of the lives approximated a normal distribution. The standard deviation of the distribution was 1.4 hours. About 95.44 percent of the batteries failed between what two values?
   (a) 19.6 and 22.4  
   (b) 18.2 and 23.8  
   (c) 18.2 and 21.0  
   (d) 16.8 and 25.2  

17. What is the area under the normal curve between \( z = -0.6 \) and \( z = -1.6 \)?
   (a) 0.2195  
   (b) 0.3413  
   (c) 0.4452  
   (d) 0.6709  

18. The mean score of a college entrance test is 500; the standard deviation is 75. The scores are normally distributed. What percent of the students scored below 380?
   (a) About 44.52%  
   (b) About 24.26%  
   (c) About 5.48%  
   (d) About 2.54%  

19. A new extended-life light bulb has an average service life of 750 hours, with a standard deviation of 50 hours. If the service life of these light bulbs approximates a normal distribution, about what percent of the distribution will be between 700 hours and 850 hours?
   (a) 68.0%  
   (b) 81.9%  
   (c) 86.4%  
   (d) 95.0%  

20. An analysis of the grades on the first test in History 101 revealed that they approximate a normal curve with a mean of 75 and a standard deviation of 8. The instructor wants to award the grade of A to the upper 10 percent of the test grades. What approximately is the dividing point between an A and a B grade?
   (a) 95  
   (b) 90  
   (c) 87  
   (d) 85