MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) The January 2005 Gallup Youth Survey telephoned a random sample of 1028 U.S. teens and asked these teens to name their favorite movie from 2004. *Napoleon Dynamite* had the highest percentage with 8% of teens ranking it as their favorite movie. Which is true?
   I. The population of interest is all U.S. teens
   II. 8% is a statistic and not the actual percentage of all U.S. teens who would rank this movie as their favorite.
   III. This sampling design should provide a reasonably accurate estimate of the actual percentage of all U.S. teens who would rank this movie as their favorite.
   A) II only
   B) I, II, and III
   C) I and II
   D) III only
   E) I only

2) A basketball player has a 70% free throw percentage. Which plan could be used to simulate the number of free throws she will make in her next five free throw attempts?
   I. Let 0,1 represent making the first shot, 2, 3 represent making the second shot,…, 8, 9 represent making the fifth shot. Generate five random numbers 0–9, ignoring repeats.
   II. Let 0, 1, 2 represent missing a shot and 3, 4,…, 9 represent making a shot. Generate five random numbers 0–9 and count how many numbers are in 3–9.
   III. Let 0, 1, 2 represent missing a shot and 3, 4,…, 9 represent making a shot. Generate five random numbers 0–9 and count how many numbers are in 3–9, ignoring repeats.
   A) I only
   B) III only
   C) I, II, and III
   D) II only
   E) II and III

3) Double–blinding in experiments is important so that
   I. The evaluators do not know which treatment group the participants are in.
   II. The participants do not know which treatment group they are in.
   III. No one knows which treatment any of the participants are getting.
   A) I and II
   B) I only
   C) I, II, and III
   D) II only
   E) III only
4) A researcher wants to compare the effect of a new type of shampoo on hair condition. The researcher believes that men and women may react to the shampoo differently. Additionally, the researcher believes that the shampoo will react differently on hair that is dyed. The subjects are split into four groups: men who dye their hair; men who do not dye their hair; women who dye their hair; women who do not dye their hair. Subjects in each group are randomly assigned to the new shampoo and the old shampoo. This experiment
   A) has two factors (shampoo type and whether hair is dyed) blocked by gender.
   B) has one factor (shampoo type), blocked by gender and whether hair is dyed.
   C) has three factors (shampoo type, gender, whether hair is dyed).
   D) is completely randomized.
   E) has two factors (gender and whether hair is dyed) blocked by shampoo type.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

5) **Good CDs** Brian is a systems manager for a large company. In his work, he has found that about 5% of all CDs he orders are bad. He needs to give one of the executives at his company five good CDs. Conduct a simulation to estimate how many CDs Brian will have to check to get five good CDs for the executive.

   a. Describe how you will use a random number table to conduct this simulation.
   b. Show three trials by clearly labeling the random number table given below. Specify the outcome for each trial.

<table>
<thead>
<tr>
<th>Trial</th>
<th>Simulation</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>03242 50692 18977 28370</td>
<td></td>
</tr>
<tr>
<td>#2</td>
<td>78695 21402 85525 81183</td>
<td></td>
</tr>
<tr>
<td>#3</td>
<td>60809 06765 39996 81915</td>
<td></td>
</tr>
</tbody>
</table>

   c. State your conclusion.

6) **Bone Builder** Researchers believe that a new drug called Bone Builder will help bones heal after children have broken or fractured a bone. The researchers believe that Bone Builder will work differently on bone breaks than on bone fractures, because of differences in initial bone condition. Bone Builder will be used in conjunction with traditional casts. To test the impact of Bone Builder on bone healing, the researchers recruit 18 children with bone breaks and 30 children with bone fractures. Design an appropriate experiment to determine if Bone Builder will help bones heal.

7) **Military funding** A college group is investigating student opinions about funding of the military. They phone a random sample of students at the college, asking each person one of these questions (randomly chosen):

   A: “Do you think that funding of the military should be increased so that the United States can better protect its citizens?”
   B: “Do you think that funding of the military should be increased?”

Which question do you expect will elicit greater support for increased military funding? Explain. What kind of bias is this?
1) B
2) D
3) A
4) B
5) a. Let the digits 00–04 represent bad CDs and the digits 05–99 represent good CDs. Look at pairs of digits in the random number table to determine if the CD is good or bad. Continue this until you get five good CDs.

<table>
<thead>
<tr>
<th>Trial</th>
<th>Simulation</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>B G G G G G</td>
<td>6 CDs</td>
</tr>
<tr>
<td>#2</td>
<td>G G G G B G</td>
<td>6 CDs</td>
</tr>
<tr>
<td>#3</td>
<td>G G G G G</td>
<td>5 CDs</td>
</tr>
</tbody>
</table>

b. Let B = bad and G = good.

c. According to my simulation, it will take an average of 5.7 CDs to get five good CDs.

6) Blocking is employed since breaks and fractures have different initial bone condition. This experiment can be double blind, if patients and bone evaluators don’t know whether or not the patient was given Bone Builder.

7) The first question will elicit greater support for increased military funding. The wording of the question appeals to the feelings of safety of the respondent. The second question does not do this – it is more neutral and will elicit less response. This is a form of response bias.