Homework #6 Name: _____

If a question is wrong, or has no acceptable answer, do not mark any choice.
If a question has several correct answers, choose the most accurate/complete/informative one.
On a separate sheet, write a detailed justification of your choice.
You will be graded on the accuracy and precision of this justification only.
You will get 1 point for each correct answer and 0 points for missing or incorrect answers.
Your grade will be written on the back of this page.

1. An *event* is:

   [-A-] A point
   [-B-] A set
   [-C-] A number
   [-D-] Passing this class ☺

2. Flip a coin 8 times. Approximately, the probability to obtain 4 heads and 4 tails is

   [-A-] 0.25
   [-B-] 0.5
   [-C-] 0.75
   [-D-] 1

3. Flip a coin 8 times. What is the probability to have at least 1 head.

   [-A-] 255/256
   [-B-] 7!/8!
   [-C-] 1 choose 8
   [-D-] none of the above

4. In a game, you are randomly given an integer n in the set $\{0, 1, 2, \dots 9\}$.
   You win (or lose if negative) the quantity $7 - 2n$.
   The expectation is:

   [-A-] You win 2
   [-B-] You break even
   [-C-] You lose 2
   [-D-] You lose 2.5

5. Let S be the set of all strings of length 3 over the alphabet $\{a, b, c\}$. If you choose randomly an element x of S, the probability that there is a vowel in x is approximately

   [-A-] 1/3
   [-B-] 1/2
   [-C-] 2/3
   [-D-] 1

6. You flip 2 coins. The first one is head.
   What is the probability that the other is head?

   [-A-] 0
   [-B-] 1/3
   [-C-] 1/2
   [-D-] 2/3

7. You flip 2 coins. One coin is head.
What is the probability that the other is head?

[-A-] 0
[-B-] 1/3
[-C-] 1/2
[-D-] 2/3

8. The conditional probability of an event E given F is

[-A-] The probability of E assuming that F has occurred
[-B-] The probability that both E and F will occur
[-C-] The probability that either E or F will occur, but not both
[-D-] The probability that E will occur when F has not occurred

9. 40 students out of 100 like biking. 50 students out of 100 like walking. If a student likes biking, the probability that she likes walking is 20%.
The probability that a student who likes walking also likes biking is approximately

[-A-] 15%
[-B-] 25%
[-C-] 50%
[-D-] 60%

10. A royal flush is a hand consisting of ace, king, queen, jack, and ten all in the same suit. Approximately how many distinct hands showing a royal flush are there in a standard 52-card deck? Hint: the card order does not matter in the game of poker, but it matters for this question.

[-A-] 5
[-B-] 50
[-C-] 500
[-D-] 5000

11. A cell phone 4-key pin can be over the digits or over the digits plus the *pound* and *star* keys. How much more difficult is to guess the pin in the second case with respect to the first one.

[-A-] about twice
[-B-] about 16 times
[-C-] about 100 times
[-D-] much more than 100 times