

## Multiple Choice Questions

### Probability - General

1. The probability that the Red River will flood in any given year has been estimated from 200 years of historical data to be one in four. This means:
  - (a) The Red River will flood every four years.
  - (b) In the next 100 years, the Red River will flood exactly 25 times.
  - (c) In the last 100 years, the Red River flooded exactly 25 times.
  - (d) In the next 100 years, the Red River will flood about 25 times.
  - (e) In the next 100 years, it is very likely that the Red River will flood exactly 25 times.
  
2. The chances that you will be ticketed for illegal parking on campus are about  $\frac{1}{3}$ . During the last nine days, you have illegally parked every day and have NOT been ticketed (you're lucky person). Today, on the 10<sup>th</sup> day, you again decide to park illegally. The chances that you will be caught are:
  - (a) greater than  $\frac{1}{3}$  because you were not caught in the last nine days.
  - (b) less than  $\frac{1}{3}$  because you were not caught in the last nine days.
  - (c) still equal to  $\frac{1}{3}$  because the last nine days do not affect the probability.
  - (d) equal to  $\frac{1}{10}$  because you were not caught in the last nine days.
  - (e) equal to  $\frac{9}{10}$  because you were not caught in the last nine days.
  
3. The chance that a person will contract AIDS after a sexual contact with an infected partner has been estimated to be  $\frac{1}{4}$ . This means:

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- (a) A person will be infected after exactly 4 sexual contacts with infected partners.
  - (b) Of 1000 people having sexual contacts with infected partners, exactly 250 will be come infected.
  - (c) Of 200 people having sexual contacts with infected partners, about 50 will be come infected.
  - (d) In exactly 25% of all sexual contacts with infected partners, the infection will spread.
  - (e) Of 20 people having sexual contacts with infected partners, it is very likely that exactly 5 people will be come infected.

4. A random variable  $Y$  has the following distribution:

$Y$		-1	0	1	2
$P(Y)$		$3C$	$2C$	0.4	0.1

The value of the constant  $C$  is:

- (a) 0.10
- (b) 0.15
- (c) 0.20
- (d) 0.25
- (e) 0.75

5. A random variable  $X$  has a probability distribution as follows:

$r$		0	1	2	3
$P(R=r)$		$2k$	$3k$	$13k$	$2k$

Then the probability that  $P(X < 2.0)$  is equal to

- (a) .90
- (b) .25
- (c) .65
- (d) .15

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(e) 1.00

6. Suppose that the allele for tallness (T) is dominant over shortness (t); that for Yellow (Y) is dominant over green (y); and that for roundness (W) is dominant over wrinkled (w). Suppose we cross two plants with genotypes TTYyWw and TtYyWw. The probability of a Tall, Yellow, Round plant is:

- (a) 9/16
- (b) 3/32
- (c) 1/16
- (d) 9/32
- (e) 3/16

7. It has been estimated that about 20% of people between the ages 18 and 25 have used marijuana in the last year. Which of the following is **CORRECT** about this statement?

- (a) Five people of this age group were randomly selected. This means that exactly one of them must have used marijuana in the last year.
- (b) Twenty people were randomly selected from this age group. Fifteen of them use marijuana in the last year. The next person selected at random will have a lower probability of using marijuana.
- (c) Ten people were randomly selected from this age group. None of them have used marijuana in the last year. The next person selected must have a higher probability of using marijuana in the last year.
- (d) A thousand people from this age group were randomly selected. It is not unusual to find that 217 of them have used marijuana in the last year.
- (e) A million people from this age group were randomly selected. There must be exactly 200,000 of them that have used marijuana in the last year.

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**The following two questions refer to the following situation.**

All human blood can be "ABO" typed as belonging to one of *A*, *B*, *O*, or *AB* types. The actual distribution varies slightly among different groups of people but for a randomly chosen person from North America, the following are the approximate probabilities:

Blood type	O	A	B	AB
Probability	.45	.40	.11	.04

8. Consider an accident victim with type *B* blood. She can only receive a transfusion from a person with type *B* or type *O* blood. What is the probability that a randomly chosen person will be a suitable donor?
- (a) about .11
  - (b) about .04
  - (c) about .15
  - (d) about .45
  - (e) about .56
9. What is the probability that both people in a couple will have the SAME blood type if matings are random with respect to blood type, i.e. one partner's blood type does not influence the blood type of the other partner.
- (a) about .21
  - (b) about .16
  - (c) about .002
  - (d) about .01
  - (e) about .38