Test 6D AP Statistics Name:

Directions: *Work on these sheets.*

Part 1: Multiple Choice. *Circle the letter corresponding to the best answer.*

1. You read in a book on poker that the probability of being dealt three of a kind in a five-card poker hand is 1/50. What does this mean?
(a) If you deal thousands of poker hands, the fraction of them that contain three of a kind will be very close to 1/50.
(b) If you deal 50 poker hands, then one of them will contain three of a kind.
(c) If you deal 10,000 poker hands, then 200 of them will contain three of a kind.
(d) A probability of 0.02 is somebody's best guess for a probability of being dealt three of a kind.
(e) It doesn't mean anything, because 1/50 is just a number.

Here is the probability model for the blood type of a randomly chosen person in the United States:

Blood type	O	A	B	AB
Probability	0.45	0.40	0.11	?

Questions 2, 3, and 4 use this information.

2. The probability that a randomly chosen American has type AB blood must be
(a) any number between 0 and 1.
(b) 0.45.
(c) 0.4.
(d) 0.96.
(e) 0.04.

3. Maria has type B blood. She can safely receive blood transfusions from people with blood types O and B. What is the probability that a randomly chosen American can donate blood to Maria?
(a) 0.11 (b) 0.44 (c) 0.45 (d) 0.51 (e) 0.56

4. What is the probability that a randomly chosen American does not have type O blood?
(a) 0.04
(b) 0.11
(c) 0.45
(d) 0.55
(e) 0.51

5. An athlete suspected of using steroids is given two tests that operate independently of each other. Test A has probability 0.9 of being positive if steroids have been used. Test B has probability 0.8 of being positive if steroids have been used. What is the probability that neither test is positive if steroids have been used?
(a) 0.72
(b) 0.38
(c) 0.02
(d) 0.28
(e) 0.08

6. An instant lottery game gives you probability 0.02 of winning on any one play. Plays are independent of each other. If you play 3 times, the probability that you win on *none* of your plays is about
(a) 0.98.
(b) 0.94.
(c) 0.000008.
(d) 0.06.
(e) 0.96.

7. The probability that you win on *one or more* of your 3 plays of the game in the previous question is about
(a) 0.06.
(b) 0.02.
(c) 0.999992.
(d) 0.04.
(e) 0.98.

8. Choose an American adult at random. The probability that you choose a woman is 0.52. The probability that the person you choose has never married is 0.24. The probability that you choose a woman who has never married is 0.11. The probability that the person you choose is either a woman or never married (or both) is therefore about
(a) 0.76.
(b) 0.65.
(c) 0.12.
(d) 0.87.
(e) 0.39.

9. Of people who died in the United States in a recent year, 86% were white, 12% were black, and 2% were Asian. (This ignores a small number of deaths among other races.) Diabetes caused 2.8% of deaths among whites, 4.4% among blacks, and 3.5% among Asians. The probability that a randomly chosen death is a white who died of diabetes is about
(a) 0.107.
(b) 0.030.
(c) 0.024.
(d) 0.86.
(e) 0.03784.

10. Using the information in the previous question, the probability that a randomly chosen death was due to diabetes is about
(a) 0.107.
(b) 0.038.
(c) 0.024.
(d) 0.96.
(e) 0.030.

Part 2: Free Response

Answer completely, but be concise. Write sequentially and show all steps.

11. Suppose you are given a standard six-sided die and told that the die is "loaded" in such a way that while the numbers 1, 3, 4, and 6 are equally likely to turn up, the numbers 2 and 5 are three times as likely to turn up as any of the other numbers.

(a) The die is rolled once and the number turning up is observed. Use the information given above to fill in the following table:

Outcome	1	2	3	4	5	6
Probability						

(b) Let A be the event: the number rolled is a prime number (a number is prime if its only factors are 1 and the number itself; note that 1 is not prime). List the outcomes in A and find $P(\text{A})$.

(c) Let B be the event: the number rolled is an even number. List the outcomes in B and find $P(\text{B})$.

(d) Are events A and B disjoint? Explain briefly.

(e) Determine if events A and B are independent.

12. Suppose there are 10 multiple choice questions on a quiz. Each question has three choices (a, b, and c) for an answer. Unfortunately, you went to see a movie the night before, and you were unprepared for the quiz. You decide to guess the correct answers by randomly choosing one of the three choices. Describe a simulation to estimate the probability of answering at least 4 of the ten questions correctly. Carry out 3 repetitions. That is, simulate taking the quiz 3 times.

Use the random digits table, starting at line **103** (reproduced below).

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line 103:   45467   71709   77558   00095   32863   29485   82226   90056
line 104:   52711   38889   93074   60227   40011   85848   48767   52573
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Address these steps:
• correspondence
• repetition
• stopping rule
• estimate probability

*I pledge that I have neither given nor received aid on this test:*_____