# Long Island University Post

# College of Management

## **MDA 525-1 Business Analytics Summer 2019**

## **Instructor: Dr. Jiamin Wang**

# Quiz 3 Due August 19

|  |  |
| --- | --- |
| **Student's Name** |  |

Section I. Multiple-choice Questions (6 points)

1. A student reasons that either he will or will not receive an “A” in the statistics class, and therefore the probability of receive an “A” is 0.5. What is wrong with this reasoning? ( )

|  |  |
| --- | --- |
| A | The events are mutually exclusive. |
| B | The events are independent. |
| C | The events are not independent. |
| D | The events are not equally probable. |

2. A weighted die comes up spots with the following probabilities:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Spots | 1 | 2 | 3 | 4 | 5 | 6 |
| Probability | 0.1 | 0.1 | 0.1 | 0.3 | 0.2 | 0.2 |

If two of these dice are thrown, what is the probability that the sum is 10? ( )

|  |  |
| --- | --- |
| A | (0.3)(0.2)+0.2 |
| B | 2(0.3)(0.2)+(0.2)2 |
| C | 2(0.3)(0.2)+2(0.2)2 |
| D | (0.3)(0.2)+(0.2)2 |

3. 52% of the U.S. population are female and 15% of the U.S. population are older than age 65. What percent of the U.S. population are women older than age 65?  ( )

|  |  |
| --- | --- |
| A | 15% |
| B | 52% |
| C | (0.52)(0.15) = 7.8% |
| D | There is insufficient information to answer this question. |

4. Consider the following table of ages of professors at a local college: ( )

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Age (yr) | < 35 | 35 – 44 | 45 – 54 | 1. 55 – 64 | 65 – 75 | >75 |
| Frequency | 10 | 30 | 25 | 15 | 15 | 5 |

What is the probability that a professor is at least 45 years old given that he or she is under 65 years old? ( )

|  |  |
| --- | --- |
| A | 0.4 |
| B | 0.5 |
| C | 0.6 |
| D | 0.8 |

5. Suppose that among the 5,000 students at a university, 2,000 live on campus and 1,800 prefer watching basketball to watching baseball. If living on campus and preferring basketball are independent, how many students both live on campus and prefer basketball to baseball? ( )

|  |  |
| --- | --- |
| A | 200 |
| B | 720 |
| C | 3,800 |
| D | There is insufficient information to answer this question. |

6. Which of the following statements on the normal distribution are correct? Select all that apply. ( )

|  |  |
| --- | --- |
| A | Any normal distribution curve is symmetric. |
| B | The mean, median and mode are identical. |
| C | The smaller the standard deviation, the lower and more spread out the normal distribution curve. |
| D | The z-score is between -3 and +3. |
| E | The area under a normal distribution curve between 0 and 2 is twice the area between 1 and 2. |

Section II. Fill-in-the-Blank Questions (9 points)

Suppose *P*(*A*) = 0.3 and *P*(*B*) = 0.6. Answer questions 1 to 3.

1. If event *A* and event *B* are mutually exclusive, *P*(*A* or *B*) = \_\_\_\_\_\_\_\_\_.
2. If event *A* and event *B* are independent, *P*(*A* or *B*) = \_\_\_\_\_\_\_\_\_.
3. If *P*(*A*|*B*) = 0.4, *P*(*A* or *B*) = \_\_\_\_\_\_\_\_\_.

One thousand people used a home test for HIV, and then all underwent more conclusive hospital testing. The accuracy of the home test was evidenced in the following table. Answer questions 4 to 6.

|  |  |  |  |
| --- | --- | --- | --- |
|  | HIV | Healthy | Total |
| Positive test | 60 | 60 | 120 |
| Negative test | 40 | 840 | 880 |
| Total | 100 | 900 | 1000 |

1. What is the probability that a person has HIV and tests positive? \_\_\_\_\_\_\_\_\_
2. What is the probability of testing positive given that the person does not have HIV? \_\_\_\_\_\_\_\_\_
3. Suppose that a person tests positive. What is the probability that the person has HIV? \_\_\_\_\_\_\_\_

Suppose that the scores on a college placement exam are normally distributed with a mean of 500 and a standard deviation of 90. Answer questions 7 to 9.

1. What is the probability that a randomly selected score is higher than 600? \_\_\_\_\_\_\_\_\_
2. What is the probability that a randomly selected score is lower than 350? \_\_\_\_\_\_\_\_\_
3. Eighty-five percent of the test takers score above \_\_\_\_\_\_\_\_.