**Probability**

**Unit Test**

**Name**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Date**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**For the following 3 questions choose any two out of three options to answer.**

* 1. There are 10 runners in a marathon. A person may bet on the race by correctly selecting the top three runners and the order they finish in. All runners have an equal chance of winning. What is the probability that a single bet will win?

|  |  |  |  |
| --- | --- | --- | --- |
| A: 0.83% | B: 2.49% | C: 0.14% | D: 0.42% |

* 1. A 5-digit PIN number can begin with any digit except zero and the remaining digits have no restriction. If repeated digits are allowed, what is the probability of the PIN code beginning with a 3 and ending with an odd number?

|  |  |  |  |
| --- | --- | --- | --- |
| A: 1/90 | B: 5/100 | C: 5/90 | D: 2/5 |

* 1. A survey determines that in a particular town, 33% of the residents jog, 42% bike, and 12% do both activities. What is the probability that a randomly selected person does neither activity?

|  |  |  |  |
| --- | --- | --- | --- |
| A: 29% | B: 61% | C: 75% | D: 37% |

* 1. If a fair 6-sided die is tossed twice, what is the probability that the first toss is a number less than 5 and the second toss is an even number?

|  |  |  |  |
| --- | --- | --- | --- |
| A: 1/3 | B: 5/6 | C: 1/6 | D: 7/6 |

* 1. Five balls are drawn without replacement from a bag containing 3 metal balls and 5 glass balls. What is the probability that at least 3 glass balls are drawn?

|  |  |  |  |
| --- | --- | --- | --- |
| A: 0.77 | B: 0.64 | C: 0.82 | D: 0.56 |

* 1. If a five card hand is dealt from a deck of 52 cards, what is the probability that the hand contains exactly one heart?

|  |  |  |  |
| --- | --- | --- | --- |
| A: 0.17 | B: 0.29 | C: 0.33 | D: 0.41 |

* 1. If 3% of the population has a specific disease, and the test for this disease is 92% accurate. What is the probability that a person does not have the disease given that the test result is positive?

|  |  |  |  |
| --- | --- | --- | --- |
| A: 0.79 | B: 0.74 | C: 0.88 | D: 0.92 |

* 1. A grocery store obtains 35% of its produce from vendor A, and 65% of its produce from vendor B. It’s expected that spoilage will result in 12% of vendor A’s produce and 17% of vendor B’s produce. What is the probability that a randomly picked produce item came from vendor A, given that it was picked from the spoiled pile?

|  |  |  |  |
| --- | --- | --- | --- |
| A: 23.5% | B: 24.2% | C: 32.7% | D: 27.5% |

* 1. In a small town with 2 schools, 1000 students were asked if they had a cell phone. The results of the survey are shown below:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Have a cell | No cell | Total |
| School A | 376 | 150 | 526 |
| School B | 403 | 71 | 474 |
| Total | 779 | 221 | 1000 |

What is the probability that a randomly selected student has a cell phone given that the student attends School A?

|  |  |  |  |
| --- | --- | --- | --- |
| A: 23.5% | B: 48.3% | C: 71.5% | D: 85% |

**Answer all of the following questions.**

In a game, stars are thrown into two circles, as shown in the diagram.

Circle A Circle B

What is the probability of a star being in Circle A?

What is the probability of a star being in Circle A **or** Circle B?

What is the probability of a star not being in Circle A **and** Circle B?

What is the probability of a star being in Circle A given that it is in Circle B?