# Introduction to Artificial Intelligence Practice Quiz

**TOTAL POINTS 10**

1. **Which definition *best* describes rationality?** 1 point

- ○ Rationality refers to the ability to make good decisions based on human emotions.
- ○ Rationality refers to the ability to make human-acceptable decisions given the sensor information received.
- ◉ Rationality refers to the ability to make good decisions given the sensor information received.
- ○ Rationality refers to making the decisions that the majority of human beings agree with.

2. **Suppose you have two boxes. In the first box, there are 3 red and 5 white balls. In the second box, there are 4 red and 2 white balls. You choose a ball at random from the first box and place it into the second box without observing the ball's color. Then you draw a ball from the second box. What is the probability that the ball is white? *(Give your answer as a decimal to the thousandths place.)*** 1 point

0.375

3. **A friend rolls two dice and tells you that there is at least one 6. What is the probability that the sum of the two dice together is *at least* 9? *(Give your answer as a decimal to the thousandths place.)*** 1 point

0.1111

4. **Suppose that there are two random variables X and Y that have joint probability. The joint probabilities of X and Y are given in the table:** 1 point

| | Y = 2 | Y = 4 | Y = 5 |
|---|---|---|---|
| **X = 1** | 1/12 | 1/24 | 1/24 |

| | | | |
|---|---|---|---|
| **X = 2** | 1/6 | 1/12 | 1/8 |
| **X = 3** | 1/4 | 1/8 | 1/12 |

**What is *P( X ≤ 2, Y ≤ 4 )*?**

0.25

5. **Suppose that there are two random variables X and Y that have joint probability. The joint probabilities of X and Y are given in the table:** 1 point

| | **Y = 2** | **Y = 4** | **Y = 5** |
|---|---|---|---|
| **X = 1** | 1/12 | 1/24 | 1/24 |
| **X = 2** | 1/6 | 1/12 | 1/8 |
| **X = 3** | 1/4 | 1/8 | 1/12 |

**What is *P( Y=2 | X=1 )*?**

.583

6. **Suppose that there are two random variables X and Y that have joint probability. The joint probabilities of X and Y are given in the table:** 1 point

| | **Y = 2** | **Y = 4** | **Y = 5** |
|---|---|---|---|
| **X = 1** | 1/12 | 1/24 | 1/24 |
| **X = 2** | 1/6 | 1/12 | 1/8 |
| **X = 3** | 1/4 | 1/8 | 1/12 |

**What is *P(Y < 6)*?**

1

7. **Assuming that the binding priorities are ¬, ∧, ∨, →, how many subformulas are there in "p → (¬p ∨ (¬¬q → (p ∧ q)))"?** 1 point

- (●) 7

- ○ 9
- ○ 6
- ○ 10

**8. Suppose you are working on temperature degree prediction (Celsius/Fahrenheit) using a learning algorithm. Which type of algorithm should you use for this problem?** 1 point

- ○ Decision Tree
- ◉ Regression
- ○ Classification
- ○ Reinforcement Learning

**9. Which description is *most accurate* for a graph search problem where, for every action, the cost is at least $\epsilon > 0$?** 1 point

- ◉ Breadth-first search is complete even if zero step costs are allowed.
- ○ Depth-first search always expands at least as many nodes as A* search.
- ○ Uniform-cost search is complete even if zero step costs are allowed.
- ○ Uniform-cost search will never expand more nodes than A*-search.

**10. Which description is *most accurate* for a graph search problem where, for every action, the cost is at least $\epsilon > 0$?** 1 point

- ○ Depth-first graph search is guaranteed to return an optimal solution.
- ◉ Uniform-cost graph search is guaranteed to return an optimal solution.
- ○ Greedy graph search is guaranteed to return an optimal solution.
- ○ Breadth-first graph search is guaranteed to return an optimal solution.