CA2 - Conditional Probability, Independence, Bayes' Theorem and Discrete Random Variable Basics

Add Instructions...

1 Numeric 5 points

Let's consider an example where you are taking a Probability and Statistics course. Let's call F be the event of failing the course, and consider the three events T_1 for getting the Mean Teacher, T_2 for getting the Nice Teacher, and T_3 for getting the Hard Teacher, which partition the sample space.

	Mean Teacher T_1	Nice Teacher T_2	Hard Teacher T_3
Probability of Teaching You $P(T_i)$	1/2	1/4	1/4
Probability of Failing You $P(F\|T_i)$	1	1/10	1/2

What is the probability of failing $P(F)$?
Please give your answer to 2 decimal places (e.g., 0.25)

0.65

2 Multiple Choice 5 points

Choose the correct answer:

Let A and B are two events in the sample space, then

- $P(A \cap B) = P(B)\,P(A|B)\,; P(B) > 0$
- $P(A \cup B) = P(A)\,P(A|B)\,; P(B) > 0$
- $P(A \cup B) = P(B)\,P(A|B)\,; P(B) > 0$
- $P(A \cap B) = P(A)\,P(A|B)\,; P(B) > 0$

3 Multiple Choice 5 points

Three fair coins are tossed. If at least two coins show head, the probability of getting one tail is:

- 3/4
- 1/3
- 3/8
- 1/2

4 Multiple Choice 3 points

An envelope contains 50 cards numbered from 1 to 50. Two cards are drawn one after another without replacement. The probability that both cards will show even numbers is:

- (●) 12/49
- ( ) 1/2
- ( ) 24/49
- ( ) None of these above

5 Multiple Choice 2 points

If the cumulative distribution function of a discrete random variable X which takes on integer values is given by:

$$F_X(a) = \begin{cases} 0 & if\ a < 0 \\ c \times \text{floor}(a) & if\ 0 \leq a < 12 \\ 1 & if\ a \geq 12 \end{cases}$$

in which, c is a constant and floor(a) refers to the greatest integer equal or smaller than a.

Which of the following is an impossible value for the probability $p_X\ (7) = P\ (X = 7)$?

- 1/11
- 2/11
- 0
- 1/12