1. If $V(x) = 3$, then $V\left(\frac{x}{3} - 3\right)$ ....

(a) 1/3 b) -2 c) 1 d) 1/9

2. For a continuous random variable X with a probability density function

$$f(x) = \begin{cases} k x^3, & 0 \le x \le 2 \\ 0, & o.w. \end{cases}$$, then the value of k is

$\int_0^2 kx^3 = \frac{k}{4}x^4 \Big]_0^2$ $4k = 1$ $k = \frac{1}{4}$

a) 16 (b) $\frac{1}{4}$ c) 4 d) $\frac{1}{16}$

3. The value of k when the probability mass function is given by, is

$$P(x) = \begin{cases} \frac{x}{k}, & x = 1,2,3,4 \\ 0, & o.w \end{cases}$$

a) 15 (b) 10 c) $\frac{1}{10}$ d) $\frac{1}{15}$

B_1 B_2 B_3

4. A company producing electric relays has three manufacturing plants producing 50%, 30%, and 20%, respectively, of its product. Suppose that the probabilities that a relay manufactured by these plants is defective are 0.02, 0.05, and 0.01, respectively. A_1 A_2 A_3 0,01 0,05 0,002 0.2×10^{-3}

i) If a relay is selected at random from the output of the company, what is the probability that it is defective?

(a) 0.027 b) 0.05 c) 0.002 d) None of them

ii) If a relay selected at random is found to be defective, what is the probability that it was manufactured by plant 2? $\frac{0,05}{0,027} = \frac{5}{9} = 0,5556$

a) 0.65 b) 0.22 c) 0.88 (d) None of them

5. If $A \subset B$, then $p(A^c|B) = \cdots$ $= \frac{P(A^c \cap B)}{P(B)} = \frac{1 - P(A)}{P(B)}$

a) $1 - p(B|A^c)$ b) P(A) (c) $1 - \frac{P(A)}{p(B)}$ d) None of them

6. If $p(A) = 0.5$, *and* $p(B|A) = 1/3$, then $p(B^c|A) = \cdots$ $\frac{P(B^c \cap A)}{P(A)} = \frac{(0,5) - \frac{1}{6}}{0,5}$

a) 1/3 $\frac{P(B \cap A)}{P(A)} = \frac{1}{3}$ (b) 2/3 c) 0.5 d) None of them

$0,5$

7. If $A = B$, Then P(A|B)= $\frac{P(A \cap B)}{P(B)}$

a) P(B|A) b) P(A) c) P(B) d) None of them

8. If the knowledge that an event A has occurred implies that a second event B cannot occur, the events A and B are said to be

a) Independent b) Mutually exclusive c) A⊂ B d) B⊂ A

9. If A and B be independent events in a sample space S, then which of the following statement(s) are true

a) A and B^c are independent b) B and A^c are independent

c) A^c and B^c are independent d) All of preceding

10. A code consists of a digit chosen from 0 to 5 followed by a letter of the alphabet.

What is the probability the code is 5Z? $\frac{1}{6} \cdot \frac{1}{26}$

a) $\frac{1}{260}$ b) $\frac{1}{156}$ c) $\frac{1}{182}$ d) None of them

11. If A *and* B are mutually exclusive events, then $p(B|A) = \cdots$

a) 1-P(A) b) P(B) c) $P(A)$ d) 0

12. If A *and* B are independent events, Then P(A|B)= $\frac{A \cdot B}{B}$

a) P(B|A) b) P(A) c) P(B) d) None of them

13. The bag contains 5 red marbles, 4 green marbles and 1 blue marble. A marble is chosen at random from the bag and not replaced; then a second marble is chosen. What is the probability both marbles are green? $\frac{4}{10} \cdot \frac{3}{9}$

a) 2/15 b) 1/4 c) 0.5 d) 4/10

14. In Exton School, 60% of the boys play baseball and 24% of the boys play baseball and football. What percent of those that play baseball also play football?

a) 0.4 b) 0.6 c) 0.24 d) 4

15. If $B \subset A$, then $p(A|B) = \cdots$

a) 1 b) P(A) c) $\frac{P(A)}{p(B)}$ d) 0