Multiple choice questions - Probability and random variables

Year: University Year 1 · 10

Question 1 If A, B are independent, $P(A \cap B) =$

- ◯ **A.** $P(A) + P(B)$
- ◯ **B.** $P(A)P(B)$
- ◯ **C.** $P(A|B)$
- ◯ **D.** 0

Question 2 $\operatorname{Var}(2X) =$

- ◯ **A.** $2 \operatorname{Var} X$
- ◯ **B.** $4 \operatorname{Var} X$
- ◯ **C.** $\operatorname{Var} X$
- ◯ **D.** $\operatorname{Var} X + 2$

Question 3 For $B(n, p)$ the mean is

- ◯ **A.** $np(1-p)$
- ◯ **B.** np
- ◯ **C.** n/p
- ◯ **D.** p

Question 4 For $\operatorname{Po}(\lambda)$ the variance is

- ◯ **A.** λ^2
- ◯ **B.** $\sqrt{\lambda}$
- ◯ **C.** λ
- ◯ **D.** $1/\lambda$

Question 5 $\Phi(0) =$

- ◯ **A.** 0
- ◯ **B.** 0.5
- ◯ **C.** 1
- ◯ **D.** 0.84

Question 6 $P(A|B)$ equals

- ◯ **A.** $\frac{P(A \cap B)}{P(B)}$
- ◯ **B.** $\frac{P(A \cap B)}{P(A)}$

- ◯ **C.** $P(A)P(B)$
- ◯ **D.** $P(B|A)$

Question 7 $X \sim N(\mu, \sigma^2)$: standardised variable is

- ◯ **A.** $\frac{X-\sigma}{\mu}$
- ◯ **B.** $\frac{X-\mu}{\sigma}$
- ◯ **C.** $\frac{X}{\sigma}$
- ◯ **D.** $X - \mu$

Question 8 Mutually exclusive events with $P(A) > 0$, $P(B) > 0$ are

- ◯ **A.** independent
- ◯ **B.** never independent
- ◯ **C.** equal
- ◯ **D.** complementary

Question 9 $\binom{5}{2} =$

- ◯ **A.** 5
- ◯ **B.** 10
- ◯ **C.** 20
- ◯ **D.** 25

Question 10 Poisson approximates binomial when

- ◯ **A.** n small, p large
- ◯ **B.** n large, p small
- ◯ **C.** $p = 0.5$
- ◯ **D.** $n = 1$

Answer grid - Probability and random variables

Year: University Year 1

Question	Answer	Explanation
1	**B**	Definition.
2	**B**	a^2.
3	**B**	Standard result.
4	**C**	Mean equals variance.
5	**B**	Symmetry.
6	**A**	Definition.
7	**B**	z-score.
8	**B**	$P(A \cap B) = 0 \neq P(A)P(B)$.
9	**B**	$\frac{5 \cdot 4}{2}$.
10	**B**	Rare events.