### Quiz: Advanced Statistics

1. Which type of probability distribution is used to model the number of successes in a fixed number of independent trials?

- A) Binomial Distribution

- B) Poisson Distribution

- C) Normal Distribution

- D) Exponential Distribution

2. Which probability distribution is used to model the number of events occurring in a fixed interval of time or space?

- A) Binomial Distribution

- B) Poisson Distribution

- C) Normal Distribution

- D) Exponential Distribution

3. Which probability distribution is symmetric and bell-shaped?

- A) Binomial Distribution

- B) Poisson Distribution

- C) Normal Distribution

- D) Exponential Distribution

4. In a binomial distribution, what is the formula for calculating the probability of k successes in n trials?

- A) P(k) = nCk \* p^k \* (1-p)^(n-k)

- B) P(k) = e^(-λ) \* λ^k / k!

- C) P(k) = μ + σZ

- D) P(k) = λ^k \* e^(-λ) / k!

5. In a Poisson distribution, what is the formula for calculating the probability of k events occurring in a fixed time interval?

- A) P(k) = nCk \* p^k \* (1-p)^(n-k)

- B) P(k) = e^(-λ) \* λ^k / k!

- C) P(k) = μ + σZ

- D) P(k) = λ^k \* e^(-λ) / k!

6. In a normal distribution, what is the percentage of data that falls within one standard deviation of the mean?

- A) 68%

- B) 95%

- C) 99.7%

- D) 100%

7. In a binomial distribution, what happens to the shape of the distribution as the number of trials increases?

- A) It becomes wider

- B) It becomes narrower

- C) It becomes taller

- D) It becomes flatter

8. In a Poisson distribution, what happens to the shape of the distribution as the mean increases?

- A) It becomes wider

- B) It becomes narrower

- C) It becomes taller

- D) It becomes flatter

### Answers

1. \*\*A) Binomial Distribution\*\*

- The binomial distribution models the number of successes in a fixed number of independent trials with a constant probability of success.

2. \*\*B) Poisson Distribution\*\*

- The Poisson distribution is used to model the number of events occurring in a fixed interval of time or space.

3. \*\*C) Normal Distribution\*\*

- The normal distribution is symmetric and bell-shaped.

4. \*\*A) P(k) = nCk \* p^k \* (1-p)^(n-k)\*\*

- This is the formula for the probability of k successes in n trials in a binomial distribution.

5. \*\*B) P(k) = e^(-λ) \* λ^k / k!\*\*

- This is the formula for the probability of k events occurring in a fixed interval in a Poisson distribution.

6. \*\*A) 68%\*\*

- In a normal distribution, approximately 68% of the data falls within one standard deviation of the mean.

7. \*\*B) It becomes narrower\*\*

- As the number of trials in a binomial distribution increases, the distribution becomes narrower.

8. \*\*A) It becomes wider\*\*

- In a Poisson distribution, as the mean increases, the distribution becomes wider.