Name _____ Score _____ Teacher _____ Date _____

Poisson Distribution

Assume events occur independently at a constant average rate. Convert rate and exposure to lambda in matching units. Use a calculator for exponentials and Poisson sums. Round final probabilities to the 3 decimal places; if that would display 0, use scientific notation.

1. Arrivals occur independently at a constant average rate of 0.4 per hour. Observe 0.75 hours. Find the probability of at least 6 arrivals.

Assumptions: The arrivals occur independently with the same constant average rate throughout the stated hour exposure; disjoint exposure segments have independent counts.

Reference: lambda = (rate per unit)(exposure), and P(X=k) = exp(-lambda) lambda^k / k!. Calculator required for exponential values and Poisson sums.

2. Arrivals occur independently at a constant average rate of 0.4 per hour. Observe 1.5 hours. Find the probability of exactly 7 arrivals.

Assumptions: The arrivals occur independently with the same constant average rate throughout the stated hour exposure; disjoint exposure segments have independent counts.

Reference: lambda = (rate per unit)(exposure), and P(X=k) = exp(-lambda) lambda^k / k!. Calculator required for exponential values and Poisson sums.

Keep rate and exposure units consistent. Round only the final result.

Name _____ Score _____ Teacher _____ Date _____

Poisson Distribution

Assume events occur independently at a constant average rate. Convert rate and exposure to lambda in matching units. Use a calculator for exponentials and Poisson sums. Round final probabilities to the 3 decimal places; if that would display 0, use scientific notation.

3. Arrivals occur independently at a constant average rate of 0.25 per hour. Observe 2 hours. Find the mean and population variance of the number of arrivals. State the count support and distinguish this Poisson count from an exponential waiting time.

Assumptions: The arrivals occur independently with the same constant average rate throughout the stated hour exposure; disjoint exposure segments have independent counts.

Reference: lambda = (rate per unit)(exposure), and P(X=k) = exp(-lambda) lambda^k / k!. Calculator required for exponential values and Poisson sums.

4. Surface flaws occur independently at a constant average rate of 1.25 per kilometer. Observe 0.5 kilometers. Find the probability of at most 7 surface flaws.

Assumptions: The surface flaws occur independently with the same constant average rate throughout the stated kilometer exposure; disjoint exposure segments have independent counts.

Reference: lambda = (rate per unit)(exposure), and P(X=k) = exp(-lambda) lambda^k / k!. Calculator required for exponential values and Poisson sums.

Keep rate and exposure units consistent. Round only the final result.

Name _____ Score _____ Teacher _____ Date _____

Poisson Distribution

Assume events occur independently at a constant average rate. Convert rate and exposure to lambda in matching units. Use a calculator for exponentials and Poisson sums. Round final probabilities to the 3 decimal places; if that would display 0, use scientific notation.

5. Surface flaws occur independently at a constant average rate of 1.5 per kilometer. Observe 2 kilometers. Find the probability of exactly 6 surface flaws.

Assumptions: The surface flaws occur independently with the same constant average rate throughout the stated kilometer exposure; disjoint exposure segments have independent counts.

Reference: lambda = (rate per unit)(exposure), and P(X=k) = exp(-lambda) lambda^k / k!. Calculator required for exponential values and Poisson sums.

6. Material defects occur independently at a constant average rate of 3 per square meter. Observe 4 square meters. Find the mean and population variance of the number of material defects. State the count support and distinguish this Poisson count from an exponential waiting time.

Assumptions: The material defects occur independently with the same constant average rate throughout the stated square meter exposure; disjoint exposure segments have independent counts.

Reference: lambda = (rate per unit)(exposure), and P(X=k) = exp(-lambda) lambda^k / k!. Calculator required for exponential values and Poisson sums.

Keep rate and exposure units consistent. Round only the final result.

Name _____ Score _____ Teacher _____ Date _____

Poisson Distribution

Assume events occur independently at a constant average rate. Convert rate and exposure to lambda in matching units. Use a calculator for exponentials and Poisson sums. Round final probabilities to the 3 decimal places; if that would display 0, use scientific notation.

7. **Arrivals occur independently at a constant average rate of 1 per hour. Observe 2 hours. Find the probability of at least 0 arrivals.**

Assumptions: The arrivals occur independently with the same constant average rate throughout the stated hour exposure; disjoint exposure segments have independent counts.

Reference: lambda = (rate per unit)(exposure), and P(X=k) = exp(-lambda) lambda^k / k!. Calculator required for exponential values and Poisson sums.

8. **Arrivals occur independently at a constant average rate of 2.5 per hour. Observe 1.5 hours. Find the probability of at most 1 arrivals.**

Assumptions: The arrivals occur independently with the same constant average rate throughout the stated hour exposure; disjoint exposure segments have independent counts.

Reference: lambda = (rate per unit)(exposure), and P(X=k) = exp(-lambda) lambda^k / k!. Calculator required for exponential values and Poisson sums.

Keep rate and exposure units consistent. Round only the final result.