

Quantitative Risk Analysis Workshop

Q1: A hospital is analysing the risk of a fire in its data centre.

- The data centre contains medical records with an asset value (AV) of \$10 million.
- If a fire occurs, the exposure factor (EF) is estimated at 25%.
- Based on historical data, the probability of such a fire is once every 10 years.

The hospital is considering installing an advanced fire suppression system that costs \$40,000 annually, which reduces the exposure factor from 25% down to 5%.

Which of the following best represents the ALE before and after control implementation, and whether the control is cost-effective?

A.

- ALE before: \$250,000
- ALE after: \$50,000
- Net savings: Yes, control is cost-effective

B.

- ALE before: \$2,500,000
- ALE after: \$500,000
- Net savings: Yes, control is cost-effective

C.

- ALE before: \$250,000
- ALE after: \$200,000
- Net savings: No, control is not cost-effective

D.

- ALE before: \$2,500,000
- ALE after: \$2,000,000
- Net savings: No, control is not cost-effective

Q2: Question:

A financial firm is assessing the risk of a ransomware attack on its customer transaction database.

- The database generates **\$25,000 of revenue per day**.
- If ransomware hits, downtime is expected to last **5 days**.
- The probability of such an attack is **once every 2 years**.
- The firm is considering a security control costing **\$15,000 annually** that will reduce downtime impact by **60%**.

Which of the following best represents the **Annualized Loss Expectancy (ALE) before and after control implementation**, and whether the control is **cost-effective**?

A.

- ALE before: \$62,500
- ALE after: \$25,000
- Net savings: Yes, control is cost-effective

B.

- ALE before: \$125,000
- ALE after: \$50,000
- Net savings: Yes, control is cost-effective

C.

- ALE before: \$62,500
- ALE after: \$37,500
- Net savings: No, control is not cost-effective

D.

- ALE before: \$125,000
- ALE after: \$75,000
- Net savings: No, control is not cost-effective

This is intentionally left blank to give you a cyber warning!

Answers are on next page. Do not scroll if you haven't worked out the answer!

Go back to question 😊

Answers and Explanation

Q1: Correct Answer = A

Step-by-Step Solution:

1. SLE (Single Loss Expectancy) before control:

- $SLE = AV \times EF = \$10,000,000 \times 25\% = \mathbf{\$2,500,000}$

2. ARO (Annualized Rate of Occurrence):

- Once every 10 years $\rightarrow 0.1$

3. ALE before control:

- $ALE = SLE \times ARO = \$2,500,000 \times 0.1 = \mathbf{\$250,000}$

4. SLE after control (reduced EF):

- New SLE = $\$10,000,000 \times 5\% = \mathbf{\$500,000}$

5. New ALE:

- New ALE = $\$500,000 \times 0.1 = \mathbf{\$50,000}$

6. Risk Reduction and Cost Comparison:

- Risk reduction = $\$250,000 - \$50,000 = \$200,000$

- Control cost = $\$40,000$

- Net benefit = $\$160,000 \rightarrow \mathbf{Yes, cost-effective}$

Q2: Correct Answer = A

Step-by-Step Solution:

1. Single Loss Expectancy (SLE):

- Daily revenue = $\$25,000$

- Downtime = 5 days

- $SLE = \$25,000 \times 5 = \mathbf{\$125,000}$

2. Annualized Rate of Occurrence (ARO):

- Once every 2 years $\rightarrow 0.5$

3. Annualized Loss Expectancy (before):

- $ALE = SLE \times ARO = \$125,000 \times 0.5 = \mathbf{\$62,500}$

4. After Control:

- Control reduces impact by 60% → New SLE = $\$125,000 \times 40\% = \$50,000$
- New ALE = $\$50,000 \times 0.5 = \mathbf{\$25,000}$

5. Compare Savings vs Cost:

- Risk reduction = $\$62,500 - \$25,000 = \$37,500$
- Control cost = $\$15,000$
- Net benefit = $\$22,500 \rightarrow \mathbf{Yes, cost-effective}$