

Question # 1

1)

$$X = \sigma_{\text{Severity-level} = \text{"Critical"}} (\text{THREAT} * \text{INCIDENT} * \text{COUNTRY})$$

$$Y = \pi_{\text{country-name}} (X)$$

2)

$$X = \text{RESPONSE_TEAM} * \text{ACTION_TAKEN} * \text{INCIDENT} * \text{THREAT}$$

$$Y = \pi_{\text{Team-name}} (\sigma_{\text{category} = \text{"Ransomware"}} (X))$$

3)

$$X = \pi_{\text{country-ID}} (\text{RESPONSE_TEAM} * \text{COUNTRY})$$

$$Y = \pi_{\text{country-ID}} (\text{COUNTRY}) - X$$

$$Z = \text{COUNTRY} * Y$$

4)

$$X = \text{category} \Join_{\text{count}(\text{country-ID})} (\text{INCIDENT} * \text{THREAT})$$

$$Y = \sigma_{\text{count} > 1} (P(\text{category}, \text{count}) (X))$$

$$Z = \pi_{\text{Threat-name}} (Y)$$

5)

$$X = \sigma_{\text{category} = \text{"AI Attack"}} (\text{INCIDENT} * \text{THREAT} * \text{COUNTRY})$$

$$Y = \pi_{\text{country-name}} (\sigma_{\text{Impact-score} > 80} (X))$$