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$E(XY) = P(I_A \cdot I_B = 1) = P(A \cap B) = 0.2$. Using
$Cov(X,Y) = E(XY) - E(X)E(Y)$ page 430 and the correlation definition page 432 we get

$$Corr(X,Y)$$

Question a) From the definition of conditional proability we have $P(A|B) = \frac{A \cap B}{P(B)}$. Now from inclusion-exclusion e.g. page 22 we have
$P(A \cap B) = P(A) + P(B) - P(A \cup B)$. Thus

$$P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{P(A) + P(B) - P(A \cup B)}{P(B)} = \frac{1}{2}$$

Question b) Since $P(A)P(B) = 0.12 < 0.2 = P(A \cap B)$ we conclude that A and B are positive depdendent (page 431).

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$$Corr(X, Y) = \frac{0.2 - 0.12}{\sqrt{0.21 \cdot 0.24}} = 0.356$$