Given two independent events A and B such $P(A) = 0.3, P(B) = 0.6$. Find

(i) $P(A \text{ and } B)$ (ii) $P(A \text{ and not } B)$

(iii) $P(A \text{ or } B)$ (iv) $P(\text{neither A nor B})$

Solution:

Given, $P(A) = 0.3$ and $P(B) = 0.6$

A and B are independent events.

(i) $P(A \text{ and } B) = P(A) \times P(B)$

$\Rightarrow P(A \cap B) = 0.3 \times 0.6 = 0.18$

(ii) $P(A \text{ and not } B) = P(A \cap B')$

$= P(A) - P(A \cap B)$

$= 0.3 - 0.18$

$= 0.12$

(iii) $P(A \text{ or } B) = P(A \cup B)$

$= P(A) + P(B) - P(A \cap B)$

$= 0.3 + 0.6 - 0.18$

$= 0.72$

(iv) $P(\text{neither A nor B}) = P(A' \cap B')$