If $P(B) = \dfrac{3}{5}$, $P(A/B) = \dfrac{1}{2}$ and $P(A \cup B) = \dfrac{4}{5}$, then $P(A \cup B)' + P(A' \cup B)$ is equal to

(a) $\dfrac{1}{5}$

(b) $\dfrac{4}{5}$

(c) $\dfrac{1}{2}$

(d) 1

Here, $P(B) = \dfrac{3}{5}$, $P(A/B) = \dfrac{1}{2}$

and $P(A \cup B) = \dfrac{4}{5}$

Since, $P(A/B) = \dfrac{P(A \cap B)}{P(B)}$

$\Rightarrow \quad P(A \cap B) = P(A/B) \cdot P(B)$

$\qquad = \dfrac{1}{2} \times \dfrac{3}{5} = \dfrac{3}{10}$

Also, $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$\Rightarrow \quad P(A) = \dfrac{4}{5} - \dfrac{3}{5} + \dfrac{3}{10} = \dfrac{1}{2}$

$\therefore \quad P(A \cup B)' = 1 - P(A \cup B) = 1 - \dfrac{4}{5} = \dfrac{1}{5}$

and $\quad P(A' \cup B) = 1 - P(A - B) = 1 - P(A \cap B')$

$\qquad = 1 - P(A) \cdot P(B')$

$\qquad = 1 - \dfrac{1}{2} \cdot \dfrac{2}{5} = \dfrac{4}{5}$

$\Rightarrow \quad P(A \cup B)' + P(A' \cup B) = \dfrac{1}{5} + \dfrac{4}{5} = \dfrac{5}{5} = 1$