

8. For any two statements  $p$  and  $q$ , the negation of the expression  $p \sqcap (\sim p \wedge q)$  is: **[Main April 9, 2019 (I)]**

(a)  $\sim p \wedge \sim q$

(b)  $p \wedge q$

(c)  $p \leftrightarrow q$

(d)  $\sim p \sqcap \sim q$

$$\begin{aligned}
 \text{8. (d) } & \sim (p \sqcap (\sim p \wedge q)) = \sim (\sim p \wedge q) \sqcup \sim p \\
 & = (\sim q \sqcup p) \sqcup \sim p \\
 & = \sim p \sqcup (p \sqcup \sim q) \\
 & = (\sim q \sqcup \sim p) \sqcup (p \sqcup \sim p) \\
 & = (\sim p \sqcup \sim q)
 \end{aligned}$$