

24. The Boolean Expression $(p \wedge \sim q) \vee q \vee (\sim p \wedge q)$ is equivalent to:

[Main 2016]

- (a) $p \vee q$
- (b) $p \vee \sim q$
- (c) $\sim p \wedge q$
- (d) $p \wedge q$

24. (a) $(p \wedge \sim q) \vee q \vee (\sim p \wedge q)$

$$\Rightarrow \{(p \vee q) \wedge (\sim q \vee q)\} \vee (\sim p \wedge q)$$

$$\Rightarrow \{(p \vee q) \wedge T\} \vee (\sim p \wedge q)$$

$$\Rightarrow (p \vee q) \vee (\sim p \wedge q)$$

$$\Rightarrow \{(p \vee q) \vee \sim p\} \wedge (p \vee q \vee q)$$

$$\Rightarrow T \wedge (p \vee q)$$

$$\Rightarrow p \vee q$$