



30. The negation of $\sim s \vee (\sim r \wedge s)$ is equivalent to

- (1) $s \wedge \sim r$ (2) $s \wedge (r \wedge \sim s)$ (3) $s \vee (r \vee \sim s)$ (4) $s \wedge r$

Answer:

$$\sim s \vee (\sim r \wedge s) = (\sim s \vee \sim r) \wedge (\sim s \vee s)$$

we know that $(\sim s \vee s) = \text{falacy} = t$ and $(\sim s \vee \sim r) = \sim(s \wedge r)$ therefore

$$\sim s \vee (\sim r \wedge s) = \sim(s \wedge r) \wedge t$$

$$\text{or } \sim s \vee (\sim r \wedge s) = \sim(s \wedge r)$$

Therefore as per question negation of $\sim s \vee (\sim r \wedge s)$

$$= \sim(\sim s \vee (\sim r \wedge s)) = \sim(\sim(s \wedge r)) = s \wedge r$$

Correct option is (4) $s \wedge r$