Q. Which of the following is not satisfied for independence of two events A and B.

Explanation: (a) $P(A|B) = P(A)$

$P(A|B)$ is the probability of event A given that B has occurred and it is equal to the probability of event A. which shows that even if event B has occured but it did not affect the occurence of event A. which tells us that events A and B are independent events. Similarly, we have

(b) $P(B|A) = P(B)$, Again it shows that occurence of event A does not affect the occurence of event B and clearly, they are independent events.

(c) $P(A|B) = \frac{P(A, B)}{P(B)}$ { Conditional Probability }

$\Rightarrow P(A, B) = P(A|B) \cdot P(B)$

If A and B are independent events that $P(A|B) = P(A)$.

$\therefore P(A, B) = P(A) \times P(B)$

So, this equation also shows the independence of two events A and B.

(d) $P(A, B) = P(A) + P(B)$ and Clearly, this equation is not satisfied for independence of two events A and B.