

Question: Three persons, A, B and C, fire at a target in turn, starting with A. Their probability of hitting the target are 0.4, 0.3 and 0.2 respectively. The probability of two hits is

(A) 0.024

(B) 0.188

(C) 0.336

(D) 0.452

Solution:

Given,

$$\Pr(A) = 0.4 \quad (1)$$

$$\Pr(B) = 0.3 \quad (2)$$

$$\Pr(C) = 0.2 \quad (3)$$

$$\Pr(A') = 1 - \Pr(A) = 0.6 \quad (4)$$

$$\Pr(B') = 1 - \Pr(B) = 0.7 \quad (5)$$

$$\Pr(C') = 1 - \Pr(C) = 0.8 \quad (6)$$

$$\text{Probability that A wins, B wins and C misses} = \Pr(A) \times \Pr(B) \times \Pr(C') \quad (7)$$

$$= 0.4 \times 0.3 \times 0.8 \quad (8)$$

$$= 0.096 \quad (9)$$

$$\text{Probability that A wins, B misses and C wins} = \Pr(A) \times \Pr(B') \times \Pr(C) \quad (10)$$

$$= 0.4 \times 0.7 \times 0.2 \quad (11)$$

$$= 0.056 \quad (12)$$

$$\text{Probability that A misses, B wins and C wins} = \Pr(A') \times \Pr(B) \times \Pr(C) \quad (13)$$

$$= 0.6 \times 0.3 \times 0.2 \quad (14)$$

$$= 0.036 \quad (15)$$

$$\therefore \text{The probability of two hits} = 0.188 \quad (16)$$