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

1) 0.024
2) 0.188
3) 0.336
4) 0.452

Solution:
Given,

$$\Pr(A) = 0.4 \tag{1}$$
$$\Pr(B) = 0.3 \tag{2}$$
$$\Pr(C) = 0.2 \tag{3}$$

$$\Pr(A') = 1 - \Pr(A) = 0.6 \tag{4}$$
$$\Pr(B') = 1 - \Pr(B) = 0.7 \tag{5}$$
$$\Pr(C') = 1 - \Pr(C) = 0.8 \tag{6}$$

The probability of two hits is

$$= \Pr(A) \times \Pr(B) \times \Pr(C') + \Pr(A) \times \Pr(B') \times \Pr(C) + \Pr(A') \times \Pr(B) \times \Pr(C) \tag{7}$$
$$= 0.4 \times 0.3 \times 0.8 + 0.4 \times 0.7 \times 0.2 + 0.6 \times 0.3 \times 0.2 \tag{8}$$
$$= 0.096 + 0.056 + 0.036 \tag{9}$$
$$= 0.188 \tag{10}$$