Three groups A, B, C are competing for positions on the Board of Directors of a company. The probabilities of their winning are 0.5, 0.3, 0.2, respectively. If the group A wins, the probability of introducing a new product is 0.7 and the corresponding probabilities for group B and C are 0.6 and 0.5, respectively. The probability that the new product will be introduced, is

(A) 0.18

(B) 0.35

(C) 0.10

(D) 0.63

Answer is (D) 0.63

Let E be the event that a new product is introduced.

Then P(A) = 0.5, P(B) = 0.3, P(C) = 0.2 and

P(E/A) = 0.7, P(E/B) = 0.6, P(E/C) = 0.5.

Since, A B, and C are mutually exclusive and exhaustive events.

$P(E) = P(A).P(E/A) + P(B) \cdot P(E/B) + P(C) \cdot P(E/C)$

$= 0.5 \times 0.7 + 0.3 \times 0.6 + 0.2 \times 0.5 = 0.35 + 0.18 + 0.10 = 0.63$