An insurance company insured 2000 scooter drivers, 4000 car drivers and 6000 truck drivers. The probabilities of an accident involving a scooter driver, car driver and a truck driver are 0.01, 0.03 and 0.15 respectively. One of the insured persons meets with an accident. The probability that the person is a scooter driver is

A $\dfrac{1}{52}$

B $\dfrac{3}{52}$

C $\dfrac{15}{52}$

D $\dfrac{19}{52}$

Correct option is A)

Solution:

Let $P(A) = P(\text{scooter}) = \dfrac{2000}{12000} = \dfrac{1}{6}$

$P(B) = P(\text{car}) = \dfrac{4000}{12000} = \dfrac{1}{3}$

and $P(C) = P(\text{truck}) = \dfrac{6000}{12000} = \dfrac{1}{2}$

Let E = Event the person meets with an accident.

Then, $P(E/A) = \dfrac{1}{100}, P(E/B) = \dfrac{3}{100}, P(E/C) = \dfrac{15}{100}$

Now, $P(A/E) = \dfrac{P(A).P(E/A)}{P(A).P(E/A) + P(B).P(E/B) + P(C).P(E/C)}$

$= \dfrac{\dfrac{1}{6} \times \dfrac{1}{100}}{\dfrac{1}{6} \times \dfrac{1}{100} + \dfrac{1}{3} \times \dfrac{3}{100} + \dfrac{1}{2} \times \dfrac{15}{100}}$

$= \dfrac{\dfrac{1}{6}}{\dfrac{1}{6} + 1 + \dfrac{15}{2}}$

$= \dfrac{1}{52}$

Hence, A is the correct option.