

Q: In a college, 30% students fail in physics, 25% fail in mathematics and 10% fail in both. One student is chosen at random. The probability that she fails in physics if she has failed in mathematics is

- 1) $\frac{1}{10}$
- 2) $\frac{2}{5}$
- 3) $\frac{9}{20}$
- 4) $\frac{1}{3}$

Solution: :

Random Variable	Subject	Probability
M	Mathematics	$\Pr(M) = 0.3$
P	Physics	$\Pr(P) = 0.25$
MP	Both	$\Pr(MP) = 0.1$

TABLE 4

TABLE 1

$$\Pr(P|M) = \frac{\Pr(MP)}{\Pr(M)} \quad (1)$$

$$= \frac{0.1}{0.3} = \frac{1}{3} \quad (2)$$

Hence, option (d) $\frac{1}{3}$ is the correct option.