

$$A = P(C=1 | R=1, H=1, M=0) = \frac{P(H=1 | C=1, R=1, M=0) P(C=1 | R=1, M=0)}{P(H=1 | R=1, M=0)} \quad \checkmark$$

$$P(C=1 | R=1, M=0) = \frac{P(R=1 | C=1, M=0) \times P(C=1 | M=0)}{P(R=1 | M=0)}$$

$$\Rightarrow A = \frac{P(H=1 | C=1, R=1, M=0) \times P(R=1 | C=1, M=0) \times P(C=1 | M=0)}{P(H=1 | R=1, M=0) \times P(R=1 | M=0)}$$

$$= \frac{P(H=1 | C=1, M=0) \times P(R=1 | C=1, M=0) \times P(C=1)}{P(H=1 | R=1, M=0) \times P(R=1 | M=0)}$$

$$= \frac{0.6 \times 0.9 \times 0.05}{\underbrace{P(H=1 | R=1, M=0)}_{(1)} \times \underbrace{P(R=1 | M=0)}_{(2)}}$$

$$(1) \sum_{C=0}^1 P(C=c, H=1 | R=1, M=0) = P(H=1 | C=c, R=1, M=0) \times P(C=c | R=1, M=0)$$

$$= P(H=1 | C=c, M=0) \times \frac{P(R=1 | C=c, M=0) \times P(C=c | M=0)}{P(R=1 | M=0)}$$

$$= P(H=1 | C=0, M=0) \times \frac{P(R=1 | C=0, M=0) \times P(C=0 | M=0)}{P(R=1 | M=0)}$$

$$+ P(H=1 | C=1, M=0) \times \frac{P(R=1 | C=1, M=0) \times P(C=1 | M=0)}{P(R=1 | M=0)}$$

$$= 0.07 \times \frac{0.05 \times 0.95}{P(R=1 | M=0)} + 0.6 \times \frac{0.9 \times 0.05}{P(R=1 | M=0)} = 0.030325 \times \frac{1}{\underbrace{P(R=1 | M=0)}_{(1.1)}}$$

$$(1.1) P(R=1 | M=0) = \sum_{C=0}^1 P(C=c, R=1 | M=0) = \sum_{C=0}^1 P(R=1 | C=c, M=0) \times P(C=c | M=0)$$

$$= P(R=1 | C=0, M=0) \times P(C=0 | M=0) + P(R=1 | C=1, M=0) \times P(C=1 | M=0)$$

$$= 0.05 \times 0.95 + 0.9 \times 0.05 = 0.0925$$

$$(1) : 0.030325 / 0.0925 = 0.3278$$

$$(2) : P(R=1 | M=0) = \sum_{C=1}^0 P(C=c, R=1 | M=0) = \sum_{C=1}^0 P(R=1 | C=c, M=0) \times P(C=c | M=0)$$

$$= P(R=1 | C=0, M=0) \times P(C=0 | M=0) + P(R=1 | C=1, M=0) \times P(C=1 | M=0)$$

$$= 0.05 \times 0.95 + 0.9 \times 0.05 = 0.0925$$

$$\Rightarrow A = \frac{0.6 \times 0.9 \times 0.05}{0.3278 \times 0.0925} = \boxed{0.89}$$

$$B = P(M=1 | H=1, C=0) = \frac{P(H=1 | C=0, M=1) \times P(M=1 | C=0)}{P(H=1 | C=0)} \quad (1)$$

$$\begin{aligned} (1): P(M=1 | C=0) &= P(M=1) = \sum_{V=0}^1 P(V=v, M=1) = \sum_{V=0}^1 P(M=1, V=v) \times P(V=v) \\ &= P(M=1 | V=0) P(V=0) + P(M=1 | V=1) P(V=1) \\ &= 0 \times 0.9999 + 0.999 \times 0.0001 = 9.99 \times 10^{-5} \end{aligned}$$

$$\begin{aligned} (2): P(H=1 | C=0) &= \sum_{M=0}^1 P(M=m, H=1 | C=0) = \sum_{M=0}^1 P(H=1 | C=0, M=m) \times P(M=m | C=0) \\ &= P(H=1 | C=0, M=0) \times P(M=0 | C=0) + P(H=1 | C=0, M=1) \times P(M=1 | C=0) \\ &= 0.07 \times [P(M=0 | V=0) P(V=0) + P(M=0 | V=1) P(V=1)] \\ &\quad + 0.98 \times 9.99 \times 10^{-5} \\ &= 0.07 \times (1 \times 0.9999 + 0.001 \times 0.0001) + 0.98 \times 9.99 \times 10^{-5} \\ &= 0.07009 \end{aligned}$$

$$B = \frac{0.98 \times 9.99 \times 10^{-5}}{0.07009} = \boxed{0.00139}$$