3.1. P (Person is COVID +ve) $= P(C+) = 0.08$

P (Person predicted +ve) $= P(P+)$

Actual \ Predicted	P	N	
P	0.9	0.1	⟷ given
N	0.03	0.97	

$$P(P+) = P(P+|C+) \cdot P(C+) + P(P+|C-) \cdot P(C-)$$
$$= 0.9 \times 0.08 + 0.03 \times (1 - 0.08)$$
$$= 0.0996$$

$$P(C+|P+) = \frac{P(P+|C+) \cdot P(C+)}{P(P+)}$$

$$= \frac{0.9 \times 0.08}{0.0996} \approx 0.723$$

Person should be diagnosed as probability of person to be covid +ve is high and greater than $P(C+)$ also.

3.2. $P(C+) = 0.6$

$$P(P+) = 0.9 \times 0.6 + 0.03 \times (1 - 0.6) = 0.552$$

$$P(C+|P+) = \frac{0.9 \times 0.6}{P(P+)} = \frac{0.54}{0.552}$$

$$\approx 0.978$$