

Q1 PART 1:-

$$P(D \cap C \cap \neg P, S) \Rightarrow$$

$$= P(D) \times P(C / \neg P, S) \times P(\neg P) \times P(S)$$

$$= 0.65 \times 0.03 \times 0.9 \times 0.3$$

$$= 0.005265$$

PART 2:-

$$P(X) = P(X|C) \times P(C) + P(X|\bar{C}) \times P(\bar{C})$$

$$= 0.9 \times P(C) + 0.2 \times P(\bar{C})$$

$$P(C) = P(C|P, S) \times P(P) \times P(S) +$$

$$P(C|P, \bar{S}) \times P(P) \times P(\bar{S}) +$$

$$P(C|\bar{P}, S) \times P(\bar{P}) \times P(S) +$$

$$P(C|\bar{P}, \bar{S}) \times P(\bar{P}) \times P(\bar{S})$$

$$= 0.01163$$

$$P(\bar{C}) = 1 - 0.01163 \Rightarrow 0.98837$$

$$P(X) = 0.9 \times 0.01163 + 0.2 \times 0.98837$$

$$= 0.208141$$