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Q-1

w_{15}

$$\begin{aligned} \therefore P(t_1) &= (1) * (0.1) * (0.7) * (0.04) * (0.4) * (0.18) * (1.0) * (1) * (0.18) \\ &= 3.6288 \times 10^{-5} \end{aligned}$$

$$\begin{aligned} P(t_2) &= (1) * (0.1) * (0.3) * (0.7) * (0.04) * (0.18) * (1) * (1) * (0.18) \\ &= 2.7216 \times 10^{-5} \end{aligned}$$

$$\begin{aligned} \therefore P(w_{15}) &= P(t_1) + P(t_2) \\ &= 6.3504 \times 10^{-5} \end{aligned}$$

Q-2

Q-3 Maria served delicious cake with chocolates.

$w_p = \text{delicious}$

$w_c = \text{cake}$

$$P_0 \quad dNP(3,4) = P(w_{12}, NP_{3,4}, w_{56} | G)$$

Inside \nearrow $= P(\text{Maria served}, NP_{3,4}, \text{with chocolates})$

Outside \searrow $P_{NP}(3,4) = P(w_{3,4} | NP_{3,4}, G)$

$= P(\text{delicious cake} | NP_{3,4}, G)$

Q-4

Changes

$NP \rightarrow DALLAS \mid ALICE \mid BOB \mid AUSTIN$

$VP \rightarrow ADORE \mid SEE \mid IN$

$S \rightarrow X \ VP$

$X \rightarrow \epsilon$

Q-5

"Robert swim the river"

Bottom-up

