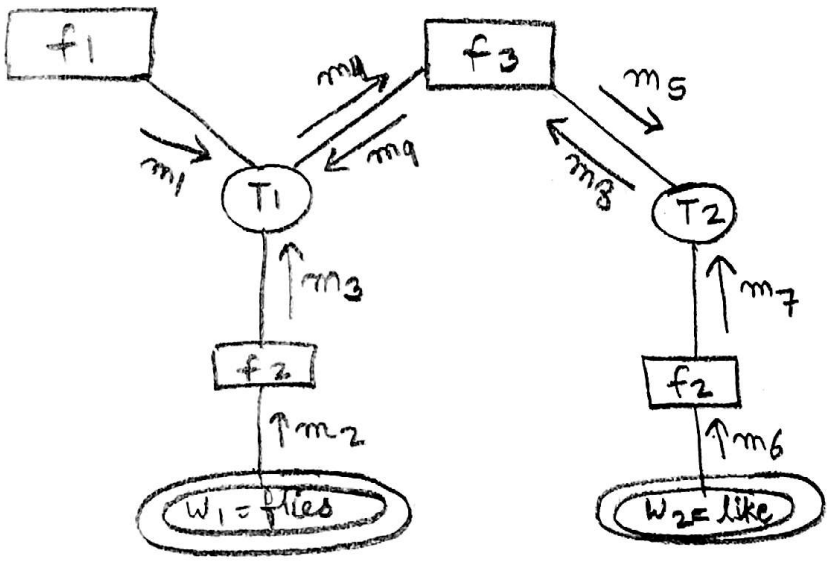
Ans (2) (a)

T_1	$P(T_1)$
N	$\frac{3000}{3000+500+2000} = 0.55$
V	$\frac{500}{3000+500+2000} = 0.09$
P	$\frac{2000}{3000+500+2000} = 0.36$

T_{i-1}	T_i	$P(T_i \mid T_{i-1})$
N	N	$\frac{400}{400+400+400} = 0.33$
N	P	$\frac{400}{400+400+400} = 0.33$
N	V	$\frac{400}{400+400+400} = 0.33$
P	N	$\frac{500}{500+20+100} = 0.81$
P	P	$\frac{20}{500+20+100} = 0.03$
P	V	$\frac{100}{500+20+100} = 0.16$
V	N	$\frac{300}{300+400+200} = 0.33$
V	P	$\frac{400}{300+400+200} = 0.44$
V	V	$\frac{200}{300+400+200} = 0.22$

T_i	W_i	$P(W_i \mid T_i)$
N	flies	$\frac{400}{400+10} = 0.98$
N	like	$\frac{10}{400+10} = 0.02$
V	flies	$\frac{200}{200+100} = 0.67$
V	like	$\frac{100}{200+100} = 0.33$
P	flies	$\frac{0}{0+200} = 0$
P	like	$\frac{200}{0+200} = 1$

(b)



(c)

T_1	m_1
N	0.55
V	0.09
P	0.36

w_1	m_2
flies	1
like	0

m_3 calculations:-

$T_1 = N$ $w_1 =$ flies $1 \times 0.98 = 0.98$

$w_1 =$ like $0 \times 0.02 = 0$

Max = 0.98

$T_1 = V$ $w_1 =$ flies $1 \times 0.67 = 0.67$

$w_1 =$ like $0 \times 0.33 = 0$

Max = 0.67

$T_1 = P$ $w_1 =$ flies $1 \times 0 = 1$

$w_1 =$ like $0 \times 1 = 0$

Max = 0

T_1	m_3
N	0.98
V	0.67
P	0

T_1	$m_4 = m_3 \times m_1$
N	$0.98 \times 0.55 = 0.54$
V	$0.67 \times 0.09 = 0.06$
P	$0 \times 0.36 = 0$

w_2	m_6
flies	0
like	1

m_5 Calculation-

$m_5 = m_4 \times f_3$

$T_2 = N$

$T_1 = N \quad 0.54 \times 0.33 = 0.18$

$T_1 = V \quad 0.06 \times 0.33 = 0.02$

$T_1 = P \quad 0 \times 0.81 = 0$

Max = 0.18

$T_2 = V$

$T_1 = N \quad 0.54 \times 0.33 = 0.18$

$T_1 = V \quad 0.06 \times 0.22 = 0.01$

$T_1 = P \quad 0 \times 0.16 = 0$

Max = 0.18

$T_2 = P$

$T_1 = N \quad 0.54 \times 0.33 = 0.18$

$T_1 = V \quad 0.06 \times 0.44 = 0.03$

$T_1 = P \quad 0 \times 0.03 = 0$

Max = 0.18

T_2	m_5
N	0.18
V	0.18
P	0.18

m_7 Calculation –

$T_2 = N$ $\quad w_2 = flies \quad 0 \times 0.98 = 0$

$w_2 = like \quad 1 \times 0.02 = 0.02$

Max = 0.02

$T_2 = V$ $\quad w_2 = flies \quad 0 \times 0.67 = 0$

$w_2 = like \quad 1 \times 0.33 = 0.33$

Max = 0.33

$T_2 = P$ $\quad w_2 = flies \quad 0 \times 0 = 0$

$w_2 = like \quad 1 \times 1 = 1$

Max = 1

T_2	m_7
N	0.02
V	0.33
P	1

optimal T_2 is →

T_2	$m_5 * m_7$
N	$0.18 \times 0.02 = 0.0036 \approx 0.004$
V	$0.18 \times 0.33 = 0.06$
P (Max value →)	$0.18 \times 1 = 0.18$ ✓ $\quad T_2^* = P$

T_2	m_8
N	0
V	0
P	1

m_9 Calculations →

T_1	$m_9 = m_8 * f_3$
N	$1 \times 0.33 = 0.33$
V (Max value →)	$1 \times 0.44 = 0.44$
P	$1 \times 0.03 = 0.03$

T_1	$m_1 * m_3 * m_9$
N (Max value →)	$0.55 \times 0.98 \times 0.33 = 0.18$ ✓
V	$0.09 \times 0.67 \times 0.44 = 0.03$
P	$0.36 \times 0 \times 0.03 = 0$

So the most likely configuration is ⇒ $T_1^* = N$

$T_1^* = N$ and $T_2^* = P$