

Question (4) :

(a) objective function:

$$\text{Minimize } \left(\sum_{t=1}^{T-1} (P_t \times H_t + c \times y_t) \right)$$

(b) constraints necessary for tracking and constraining the fungus:

(1) ~~Infected~~ Infected area of fungus:

$$x_{t+1} = (1.1 \times x_t) - 0.15(x_t - y_t)$$

$$\therefore x_{t+1} = 0.95(x_t - y_t)$$

(2) ~~(2)~~ Total infected area constraint:

$$x_t \leq 2V$$

~~(2)~~ (3) Boundary constraint:

$$x_{T+1} \leq V$$

(c) Balance constraints:

$$I_{t-1} + H_t - d_t - 4y_t = I_t$$

$$I_{T+1} = 0 \quad \left. \vphantom{I_{T+1}} \right\} \text{inventory on the last day.}$$