DATE : . . .

3. $X_t = \begin{cases} 0 & \text{if 작동} \\ 1 & \text{if 고장} \end{cases}$

$P_{00} = \{ X_{t+1} = 0 \mid X_t = 0 \} = 0.95$

$P_{01} = \{ X_{t+1} = 1 \mid X_t = 0 \} = 0.05$

$P_{10} = \{ X_{t+1} = 0 \mid X_t = 1 \} = 0.9$

$P_{11} = \{ X_{t+1} = 1 \mid X_t = 1 \} = 0.1$

$$\therefore P = \begin{array}{c} \text{state} \\ 0 \\ 1 \end{array} \begin{array}{c} \begin{array}{cc} 0 & 1 \end{array} \\ \begin{bmatrix} 0.95 & 0.05 \\ 0.9 & 0.1 \end{bmatrix} \end{array}$$

$\mu_{00} = 1 + P_{01} \cdot \mu_{10} = 1 + 0.05 \cdot \mu_{10}$ ... ①

$\mu_{01} = 1 + P_{00} \mu_{01} = 1 + 0.95 \cdot \mu_{01}$ ... ②

$\mu_{10} = 1 + P_{11} \mu_{10} = 1 + 0.1 \cdot \mu_{10}$ ... ③

$\mu_{11} = 1 + P_{10} \cdot \mu_{01} = 1 + 0.9 \cdot \mu_{01}$ ... ④

② → $\mu_{01} = 1 + 0.95 \cdot \mu_{01}$ → $0.05 \mu_{01} = 1$ ⇒ $\mu_{01} = 20$

→ ④ 대입 → $\mu_{11} = 1 + 0.9 \cdot 20 = 18$

③ → $\mu_{10} = 1 + 0.1 \cdot \mu_{10}$ → $0.9 \mu_{10} = 1$ ⇒ $\mu_{10} = 1.1111$

→ ① 대입 → $\mu_{00} = 1 + 0.05 \cdot 1.1111 = 1.0555$

$\therefore$ $\mu_{00} = 1.0555$

$\mu_{01} = 20$

$\mu_{10} = 1.1111$

$\mu_{11} = 19$