It is easy to see that $\tau = 0.73$, $\sigma = 0.2$, and assumption (H) is satisfied with $F_1 = 0$, $F_2 = \text{diag}(1, 1)$, $F_3 = 0$, $F_4 = \text{diag}(0.5, 0.5)$.

By the Matlab LMI Control Toolbox, we find a solution to the LMIs in (9) and (10), and obtain the gain matrix $K$ as

$$ K = \begin{bmatrix} 3.6204 & -12.3204 \\ -4.9739 & 138.9582 \end{bmatrix}. $$