1. Calculate P and J in $\ddot{y} = P + J\ddot{q}$ where y is given as
   $y = \begin{pmatrix} l_1 \cos(q_1) + l_2 \cos(q_1 + q_2) \\ l_1 \sin(q_1) + l_2 \sin(q_1 + q_2) \\ q_3 \end{pmatrix}$
   where l_1, l_2, l_3 are constant values and q_1, q_2, q_3 are joint angular positions.

2. Decoupling matrix R^{-1} is given as
   $R^{-1} = \begin{bmatrix} \sin\delta & 0 & 0 \\ 0 & \cos\delta & 0 \\ 0 & 0 & e \end{bmatrix}$.
   Give conditions for which this matrix is not singular.

3. Describe a soft constraint in MPC. How can it be introduced in the algorithm?

4. Describe PendSV (Pended Service Call) and SVC (Supervisor Call) exceptions.