

Question 7:

7.1(a) index: \mathbb{I} . coordinate: (x_1, x_2)

$$\therefore \mathbb{I} = x_1 + x_2 \cdot L_1.$$

$$\therefore x_1 = \mathbb{I} \bmod L_1. \quad \therefore x_2 = (\mathbb{I} - x_1) \bmod L_1.$$

7.2(a) index: \mathbb{I} , coordinate: (x_1, x_2, \dots, x_d)

$$\mathbb{I} = x_1 + x_2 \cdot L_1 + x_3 \cdot L_1 L_2 + \dots + x_d \cdot L_1 L_2 \dots L_{d-1}.$$

$$\therefore x_1 = \mathbb{I} \bmod L_1.$$

$$x_2 = (\mathbb{I} - x_1) \bmod L_2.$$

$$x_3 = (\mathbb{I} - x_1 - x_2 L_1) \bmod L_3.$$

\vdots

$$x_{d-1} = (\mathbb{I} - x_1 - x_2 L_1 - \dots - x_{d-2} \cdot L_{d-3}) \bmod L_{d-1}.$$

$$x_d = [\mathbb{I} / L_1 L_2 \dots L_{d-1}].$$

$$x_d = \left(\frac{\mathbb{I} - x_1 - x_2 L_1 - \cancel{x_3 L_1 L_2} - \dots - x_{d-1} L_1 \dots L_{d-2}}{L_1 L_2 \dots L_{d-1}} \right) \bmod L_d.$$