

Week 11.

4.18.

H 7 6 5 4 3 2 1

 $D_4 D_3 D_2 P_3 D_1 P_2 P_1$ $2^2 D_4 D_3 D_2 P_3$ $2^1 D_4 D_3 D_1 P_2$ $2^0 D_4 D_2 D_1 P_1$

1). 1 1 0 0 1 0 0

$$\text{则 } S_3 = P_3 \oplus D_4 \oplus D_3 \oplus D_2 = 0$$

$$S_2 = P_2 \oplus D_4 \oplus D_3 \oplus D_1 = 1$$

$$S_1 = P_1 \oplus D_4 \oplus D_2 \oplus D_1 = 0$$

故第2位出错, 即 1100100 出错

2). 1100111

$$S_3 = 0, S_2 = 0, S_1 = 1$$

故第1位出错, 即 1100111 出错

3). 1100000

 $S_3 = 0, S_2 = 0, S_1 = 1$, 第1位出错, 即 1100000 出错

4). 1100001

 $S_3 = 0, S_2 = 0, S_1 = 0$, 无出错

4.20. H 11 10 9 8 7 6 5 4 3 2 1

D_7 D_6 D_5 D_4 D_3 D_2 P_3 D_1 P_2 P_1

2^3 D_7 D_6 D_5 P_4

2^2 D_4 D_3 D_2 P_3

2^1 D_7 D_6 D_4 D_3 D_1 P_2

2^0 D_7 D_5 D_4 D_2 D_1 P_1

对于 1 0 0 1 1 0 0 1

$$P_4 = \overline{D_7 \oplus D_6 \oplus D_5} = 0$$

$$P_3 = \overline{D_4 \oplus D_3 \oplus D_2} = 1$$

$$P_2 = 1, P_1 = 0$$

∴ 正确码为 100 0110 1110

若第6位出错, 则变为 100 0100 1110

$$S_4 = \overline{D_7 \oplus D_6 \oplus D_5 \oplus P_4} = 0$$

$$S_3 = \overline{D_4 \oplus D_3 \oplus D_2 \oplus P_3} = 1$$

$$S_2 = \overline{D_7 \oplus D_6 \oplus D_4 \oplus D_3 \oplus D_1 \oplus P_2} = 1$$

$$S_1 = \overline{D_7 \oplus D_5 \oplus D_4 \oplus D_2 \oplus D_1 \oplus P_1} = 0$$

∴ D_3 出错, 即第6位.

$$4.42. \quad \text{例} \quad G(x) = 1011$$

$$M(x) = 1001$$

$$\frac{M(x) \cdot x^3}{G(x)} = \frac{1001000}{1011} = 1010 + \frac{110}{1011}$$

$$\text{故编码为 } M(x) \cdot x^3 + 110 = 1001110$$