Homework 2: EE 252 Digital Electronics

1. 2.3 Use algebraic manipulation to prove that $xy + yz + \bar{x}z = xy + \bar{x}z$.

Note that this is the consensus property 17*a* in Section 2.5.

2. 2.4 Use the Venn diagram to prove the identity in Problem 2.3.

3. 2.21 Design the simplest sum-of-products circuit that implements the function

$$f(x_1, x_2, x_3) = \sum m(1, 3, 4, 6, 7).$$

4. 2.22 Design the simplest product-of-sums circuit that implements the function

$$f(x_1, x_2, x_3) = \Pi M(0, 2, 5).$$

5. 2.28 Design the simplest circuit that has three inputs, x_1, x_2, and x_3, which produces an output value of 1 whenever two or more of the input variables have the value 1; otherwise, the output has to be 0.

6. 2.31 For the timing diagram in Figure P2.3, synthesize the function $f(x_1, x_2, x_3)$ in the simplest product-of-sums form.

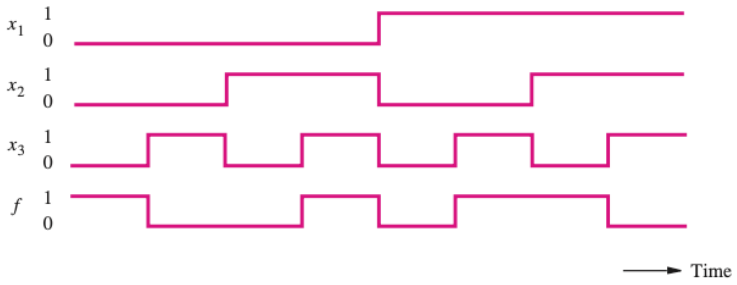

Figure P2.3 A timing diagram representing a logic function.