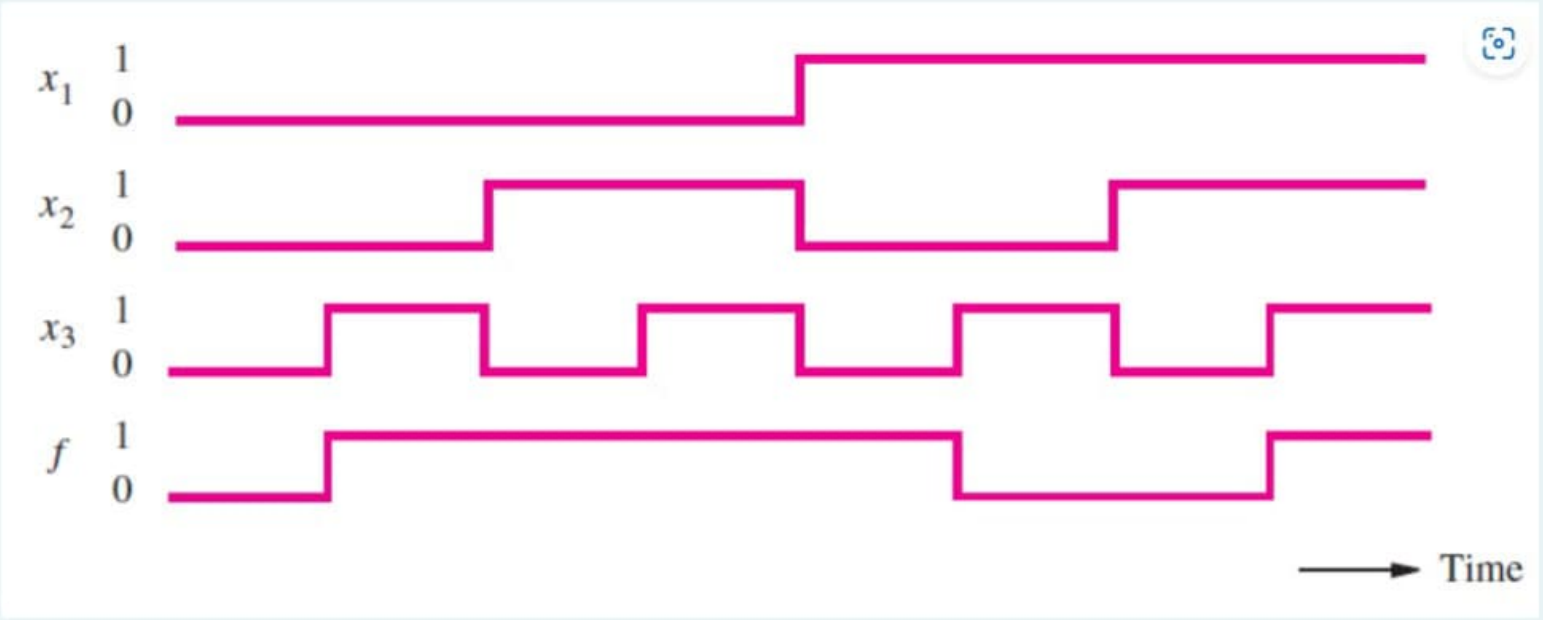
Determine the decimal values of the following 1's complement number: 100010

- a. 85
- b. 91
- c. 93
- d. 88

Clear my choice

For the timing diagram shown below, what is the function $f(x_1, x_2, x_3)$ in the simplest product-of-sums form?



- a. $(x_1 + x_2 + x_3)(\bar{x}_1 + x_2 + \bar{x}_3)(\bar{x}_1 + \bar{x}_2 + x_3)$
- b. $(x_1 + x_2 + \bar{x}_3)(\bar{x}_1 + x_2 + \bar{x}_3)(x_1 + \bar{x}_2 + x_3)$
- c. $(x_1 + \bar{x}_2 + x_3)(\bar{x}_1 + x_2 + x_3)(\bar{x}_1 + \bar{x}_2 + x_3)$
- d. $(x_1 + x_2 + x_3)(x_1 + \bar{x}_2 + \bar{x}_3)(\bar{x}_1 + x_2 + x_3)$

Clear my choice

What is the 2's complement of the decimal number 83?

- a. 000001001000
- b. 000001010101
- c. 000000101001
- d. 000000101101

Clear my choice

Find the minimum-cost SOP form for the function $f(x_1, x_2, x_3) = \sum m(1, 4, 7) + D(2, 5)$.

- a. $x_1\bar{x}_2 + x_1x_3$
- b. $x_1\bar{x}_2 + x_1x_3 + \bar{x}_2x_3$
- c. $x_1\bar{x}_2 + x_2x_3$
- d. $x_1\bar{x}_3 + x_2x_3 + \bar{x}_1x_2$

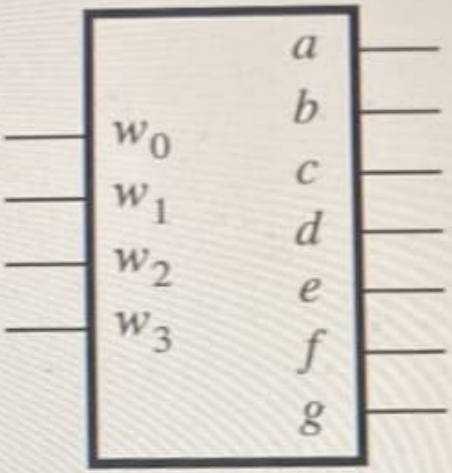
Clear my choice

What is the simplest sum-of-products expression that implements the function $f(x_1, x_2, x_3) = \sum m(3, 4, 6, 7)$.

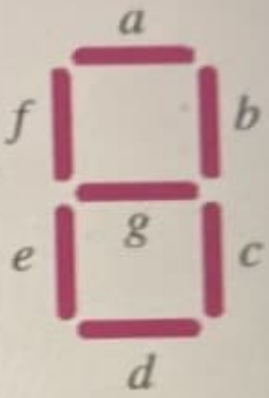
- a. $x_2x_3 + x_1\bar{x}_3$
- b. $x_1x_2 + x_2\bar{x}_3$
- c. $x_1x_3 + x_1\bar{x}_2$
- d. $x_2x_3 + x_1\bar{x}_2$

Clear my choice

A hex-to-7-segment decoder can be implemented as shown in the following figure. Digits 0 to 9 to-7-segment decoder. Digits 10 to 15 are displayed as A, B, C, D, E, and F. Derive minimal sum-of segment display.



(a) Code converter



(b) 7-segment display

- a. $\bar{w}_0 w_1 + w_0 w_3 + w_1 w_3 + \bar{w}_2 w_3 + \bar{w}_1 w_2 w_3$
- b. $\bar{w}_0 w_1 + w_1 w_3 + \bar{w}_2 w_3 + \bar{w}_1 w_2 \bar{w}_3$
- c. $\bar{w}_0 w_1 + w_0 w_3 + w_1 w_3 + \bar{w}_2 w_3 + \bar{w}_1 w_2 \bar{w}_3$
- d. $\bar{w}_0 w_2 + \bar{w}_1 w_3 + w_1 w_2 + \bar{w}_1 w_3 + \bar{w}_1 w_2 \bar{w}_3$

Clear my choice

What is the simplest product-of-sums expression for the function $f(x_1, x_2, x_3) = \prod M(0, 1, 5, 7)$.

- a. $(x_1 + x_2)(\bar{x}_1 + x_3)$
- b. $(x_1 + x_3)(x_1 + \bar{x}_3)$
- c. $(x_1 + x_2)(x_1 + \bar{x}_3)$
- d. $(x_1 + x_2)(\bar{x}_1 + \bar{x}_3)$

Clear my choice

A four-variable logic function that is equal to 1 if any three or all four of its variables are equal to 1 is called a majority function. What is the minimum-cost SOP implementation of this majority function?

- a. $x_1\bar{x}_2x_3 + x_1x_2x_4 + x_1\bar{x}_3x_4 + x_2x_3x_4$
- b. $x_1x_2x_3 + x_1x_3\bar{x}_4 + x_1x_3x_4 + \bar{x}_3x_3x_4$
- c. $x_1x_2x_3 + x_1x_2x_4 + x_1\bar{x}_3x_4 + x_2x_3x_4$
- d. $x_1x_2x_3 + x_1x_2x_4 + x_1x_3x_4 + x_2x_3x_4$

Clear my choice

Consider the function $f = \bar{w}_1\bar{w}_2 + \bar{w}_2\bar{w}_3 + w_1w_2w_3$.

What is the correct Shannon's expansion in terms of w_2?

- a. $\bar{w}_1(\bar{w}_2) + w_1(w_2w_3)$
- b. $\bar{w}_2(\bar{w}_1) + w_2(w_1\bar{w}_3)$
- c. $\bar{w}_2(\bar{w}_3) + w_2(w_1 + w_3)$
- d. $\bar{w}_2(\bar{w}_1 + \bar{w}_3) + w_2(w_1w_3)$

Clear my choice