GATE:IN-42-2023

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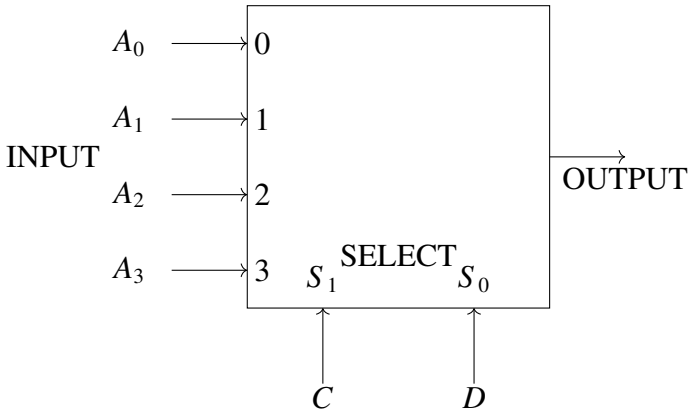
I. QUESTION

Consider the 2-bit multiplexer(MUX) shown in the figure. For OUTPUT to be the XOR of C and D, the values of A_0,A_1,A_2 and A_3 are:

(A) $A_0 = 0$, $A_1 = 0$, $A_2 = 1$, $A_3 = 1$
(B) $A_0 = 1$, $A_1 = 0$, $A_2 = 1$, $A_3 = 0$
(C) $A_0 = 0$, $A_1 = 1$, $A_2 = 1$, $A_3 = 0$
(D) $A_0 = 1$, $A_1 = 1$, $A_2 = 0$, $A_3 = 0$



II. SOLUTION

Let Output be denoted by Y, then:

$$Y = \overline{C}.\overline{D}.A_0 + \overline{C}.D.A_1 + C.\overline{D}.A_2 + C.D.A_3 \tag{1}$$

Given

$$y = C \oplus D \tag{2}$$

Then

$$A_0 = 0 \tag{3}$$
$$A_1 = 1 \tag{4}$$
$$A_2 = 1 \tag{5}$$
$$A_3 = 0 \tag{6}$$

Code for implementation through assembly onto arduino-uno write link here