

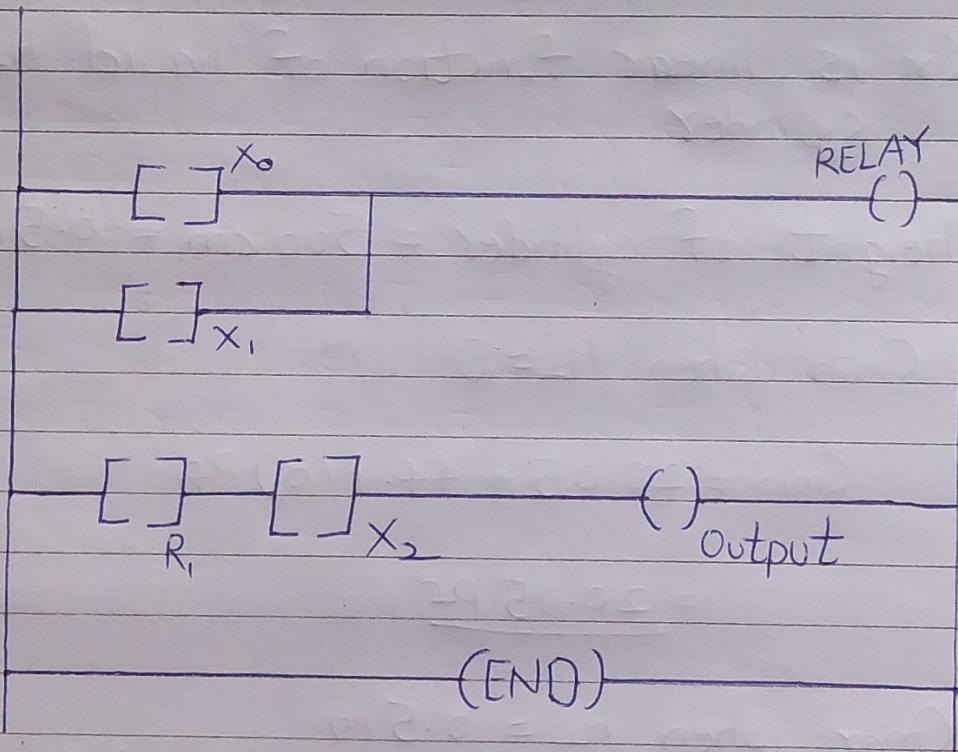
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Div - 1 (Comp) Batch :- S4

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* Graded Activity 6 *

Q.1 Given ladder diagram



Turn ON/OFF combination of switches and record Y in truth table

X_0	X_1	X_2	Y
0	0	0	0
0	0	1	0
0	1	0	0
1	0	0	0

x_0	x_1	x_2	Y
1	0	1	1
1	1	0	0
1	1	1	1
0	1	1	1

Q.2 Simplify truth table to boolean equation or describe AND/OR logic relation within 10



Constructing a K-map from truth table

$x_0 \backslash x_2$	00	01	11	10
0	0	0	1	0
1	0	1	1	0

$$Y = x_0 x_2 + x_1 x_2$$

$$Y = (x_0 x_1) \cdot x_2$$

Here we can say that x_0 & x_1 are connected to an OR gate. The output of OR gate is connected to an AND gate along with x_2 .

It means that to get output x_2 should always be closed & either x_0 or x_1 or both closed.

Q 3 What is function of relay R₁. How it relates to 1st ladder logic diagram



- 1] Electrochemical relays R₁ are connected together to perform logic & control function
- 2] Relays are used when it is necessary to control a circuit by an independent low power signal, or where overall circuit must be controlled by one signal.
- 3] Relays take small signal as input the electrochemical switch provide connection between high power circuit
- 4] The function of relay R₁ in given LD is to control output of 2 rungs in rung. The high power signal is carried over to next rung to get output Y