

LECTURE 42 – DESIGN OF PNEUMATIC CIRCUIT USING PLC

SELF EVALUATION QUESTIONS AND ANSWERS

Q1. A multi position cylinder consisting of cylinder A and Cylinder B is used to operate a pneumatically actuated switching station. (Figure 1) for distributing work pieces to four different conveyors. Assume the maximum stroke of cylinder A as 50 mm and that of cylinder B is 100mm. Switching to any of the distribution conveyor is to be initiated by means of push button(PBs) and any desired sequence should be possible. Complete the control scheme and develop a control circuit to accomplish the desired control task.

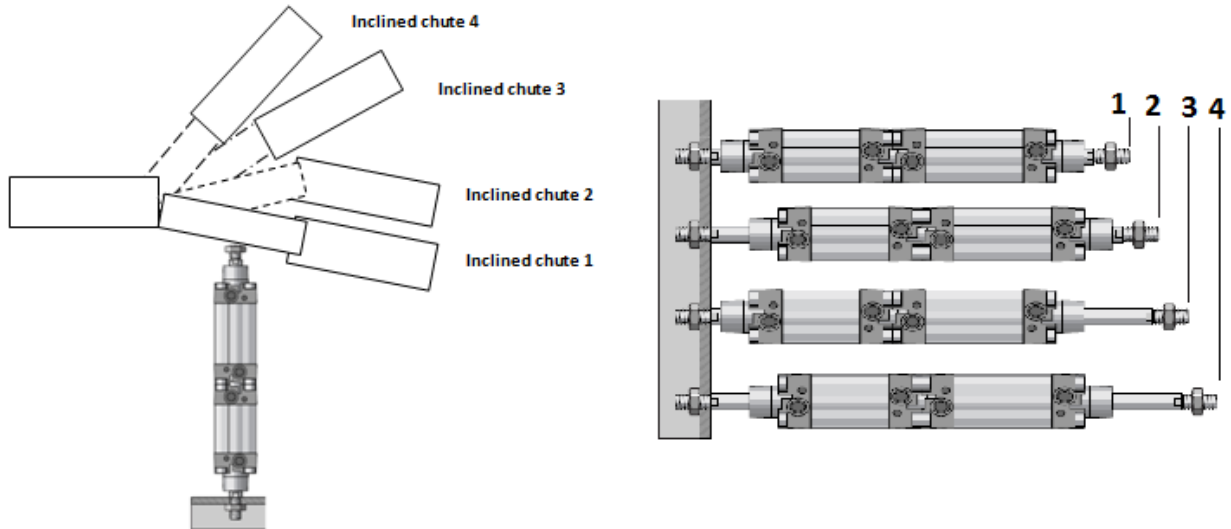
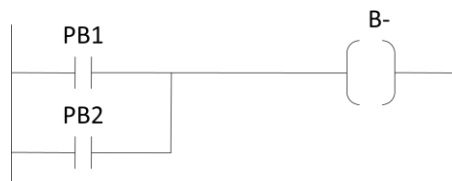
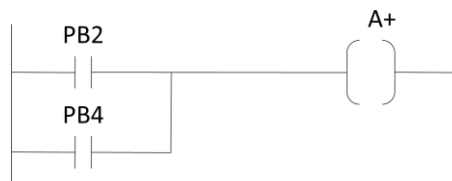
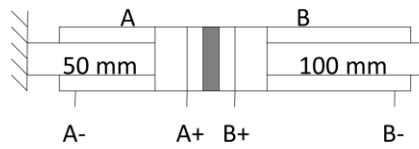


Figure 1

Solution question no 1

Position	Distance	PB	Notation	
1	0mm	PB1	A-	A+
2	50 mm	PB2	A+	B-
3	100mm	PB3	A-	B+
4	150	PB4	A+	B+

Press one pushbutton at a time. Or you can imagine that it is a selector switch to select any one of the four positions.



Q2 A pneumatically controlled double sliding door is used in the metrology lab (figure 2). Double sliding door is to be controlled either from OUTSIDE by pressing pushbutton. Or an INSIDE push button. The opening and closing operations are initiated by the same pushbutton in each case. The speeds of the double sliding door movements are to be adjustable. Develop a pneumatic control circuit to implement this given task.

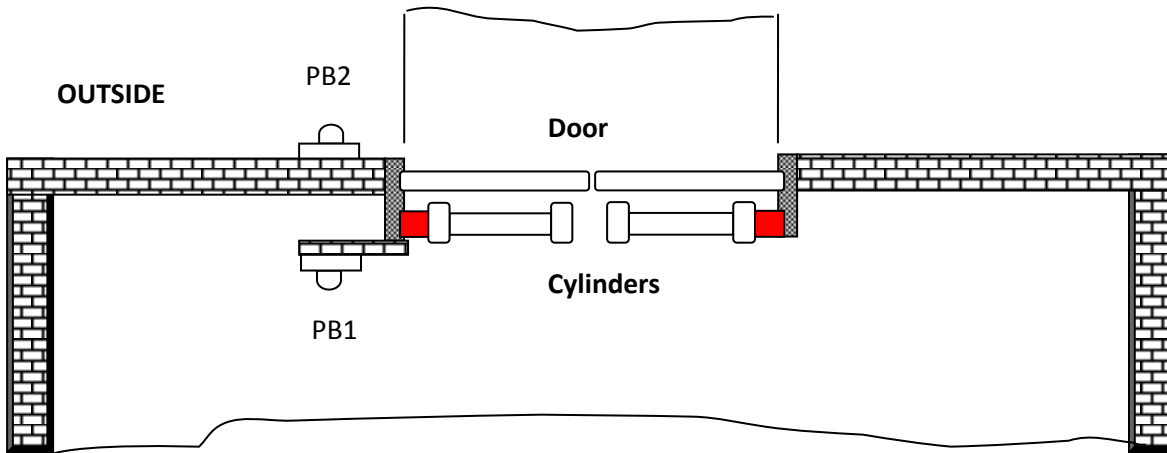
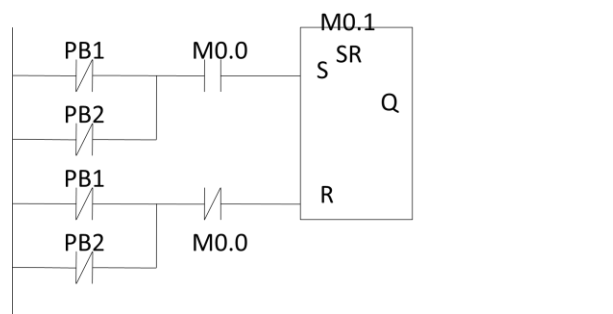
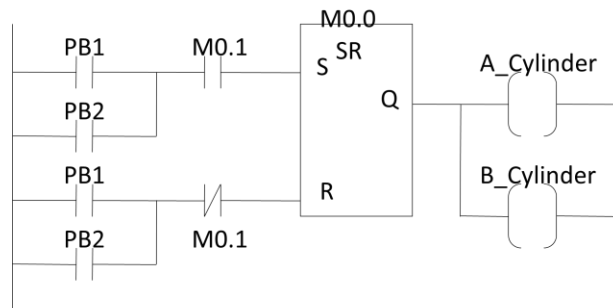


Figure 2

Solution question no2



Q3. In a automobile manufacturing unit, components are to be supplied to a processing machine from the discharge rail of a vibrator conveyor as shown in Figure 3. Cylinder 1.0 to extends and picks up the component from the discharge rail and then retracts. Cylinder 2.0 extends and shifts the component to the machine. Cylinder 1.0 extends once again, lowering and dropping the component to the machine. At the end, cylinders 1.0 and 2.0 retract one after another. Develop a pneumatic control circuit to implement the control task. Avoid signal conflicts in the circuit

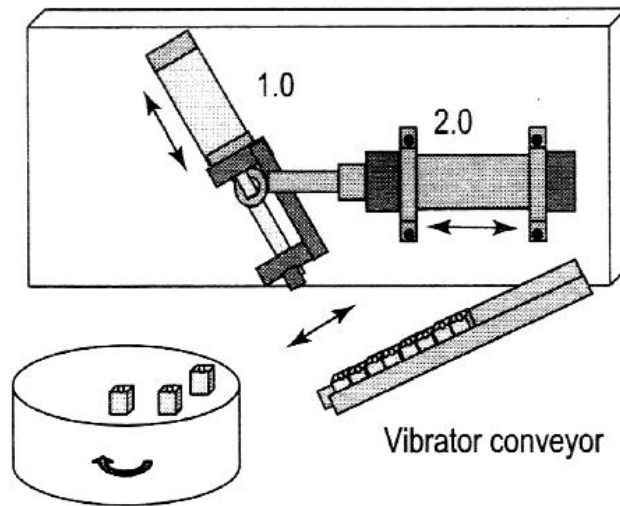


Figure 3

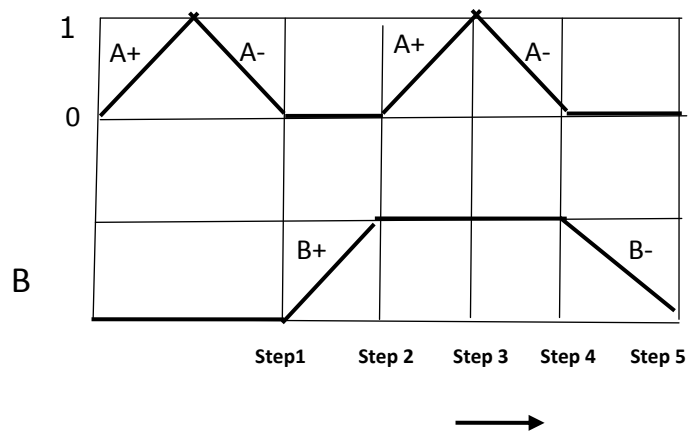


Figure 4 Displacement step diagram

Solution question no 3

