

Unit - 4

Subject Name : Hydraulic and Pneumatic

Subject Code : ME 8694

YEAR / SEM : 3rd Year / VIth sem.

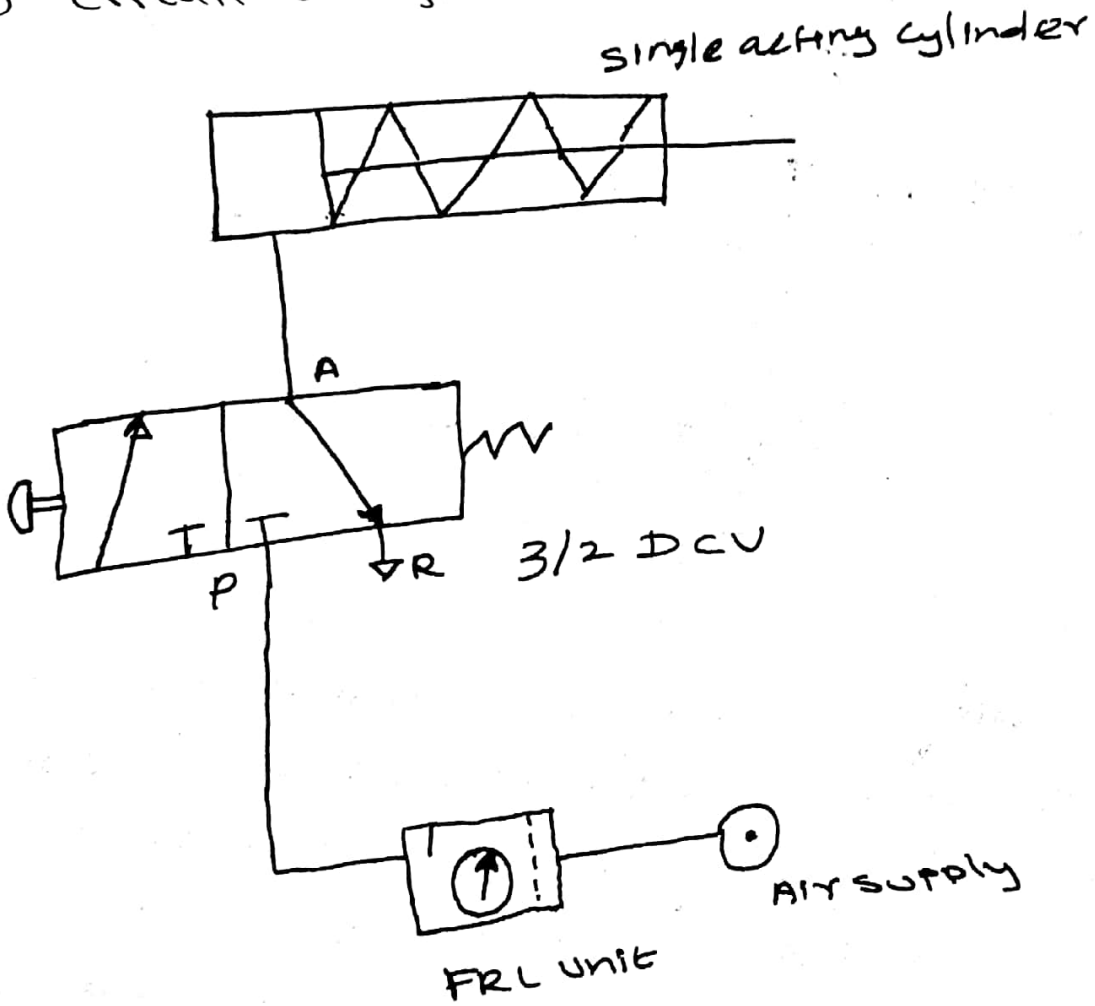
Name of Faculty : S. DINESH

Unit-4

① Design pneumatic circuit flowing.

- (i) Control of single acting pneumatic cylinder
- (ii) Control of double acting pneumatic cylinder.

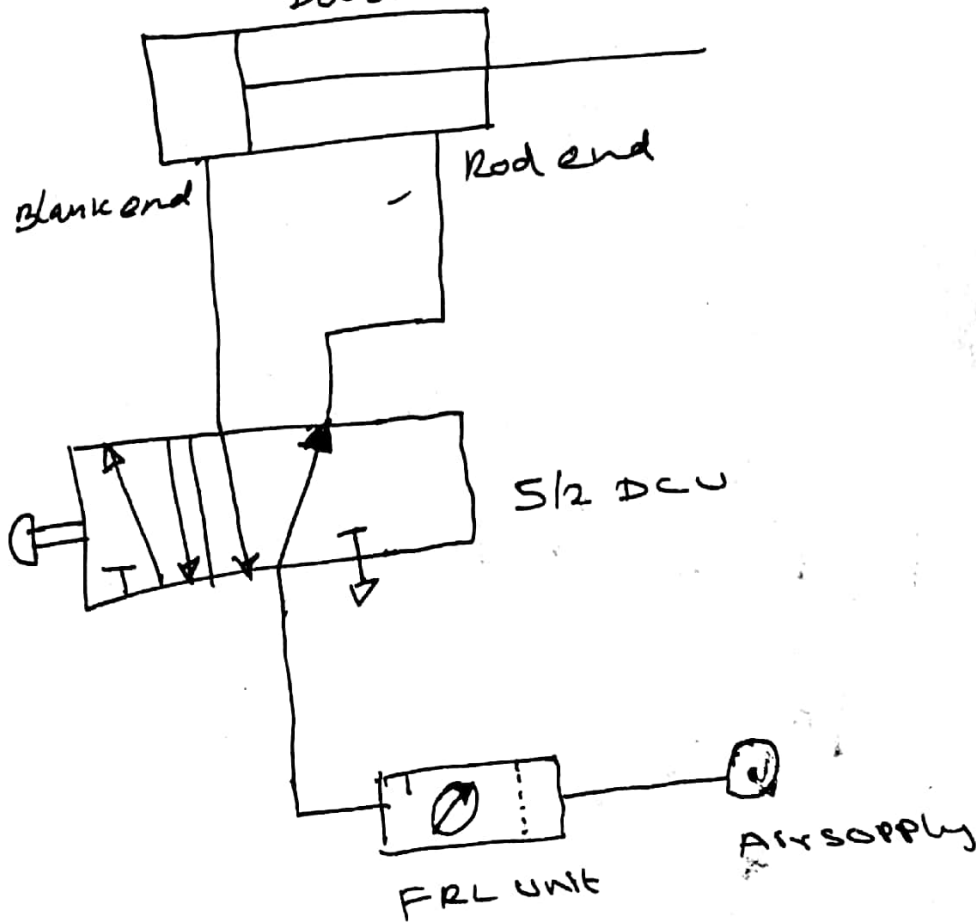
(i) circuit diagram.



The figure shows a simple circuit of a single acting pneumatic cylinder operation. The circuit consist of a FRL unit 3/2 DCV and a single acting cylinder - return. by spring. The direction control valve (DCV) used in this circuit is a two position three way push button actuated spring return valve.

Circuit diagram.

Double acting cylinder.



The figure shows a simple circuit for the operation of a double-acting pneumatic cylinder. The circuit consists of an FRL unit, 5/2 DCV and double acting cylinder. The direction control valve (DCV) used here is a two position five way push button-actuated spring return valve.

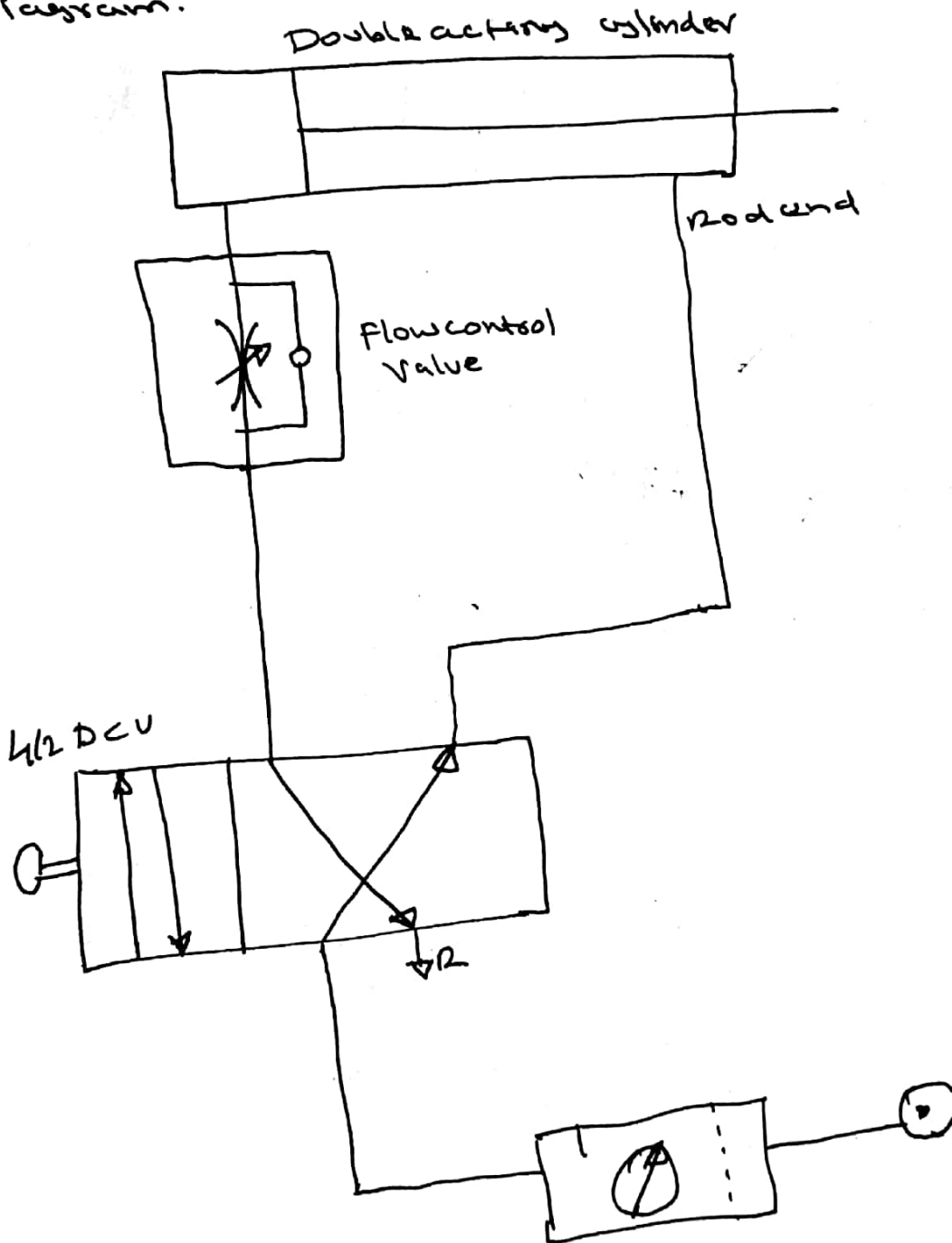
② Draw pneumatic circuit for speed control circuit using in flow control valve.

- (i) meter in circuit
- (ii) meter out circuit
- (iii) bleed off circuit.

Meter in Circuit

The fluid power circuit, in which the flow control valve is located in the pressure line leading to the work cylinder, is called meter in circuit.

Diagram.



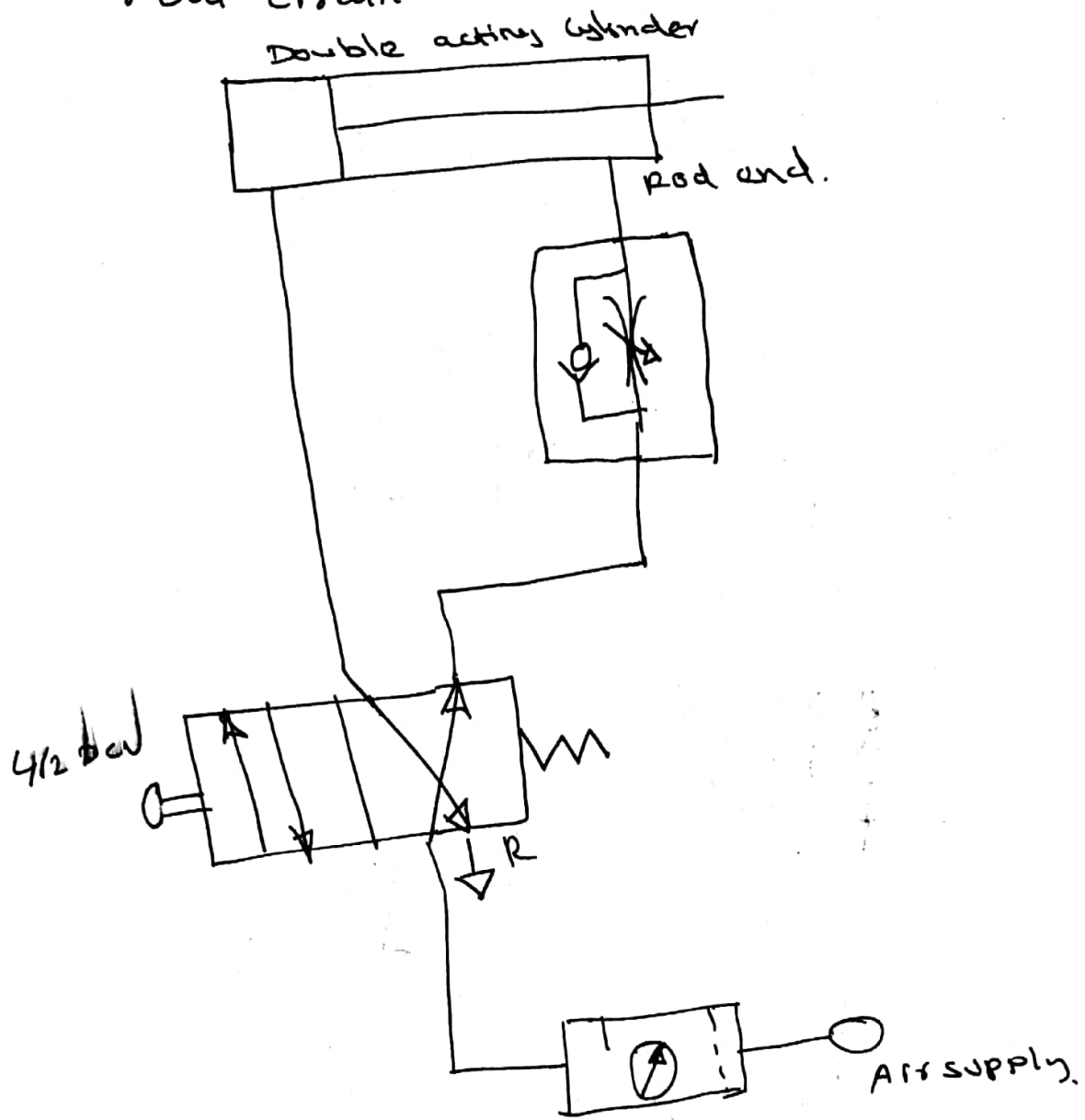
(ii) Meter Out Circuit

The fluid power circuit in which the flow control valve is located in the return line of the cylinder is called meter out circuit.

Project Name
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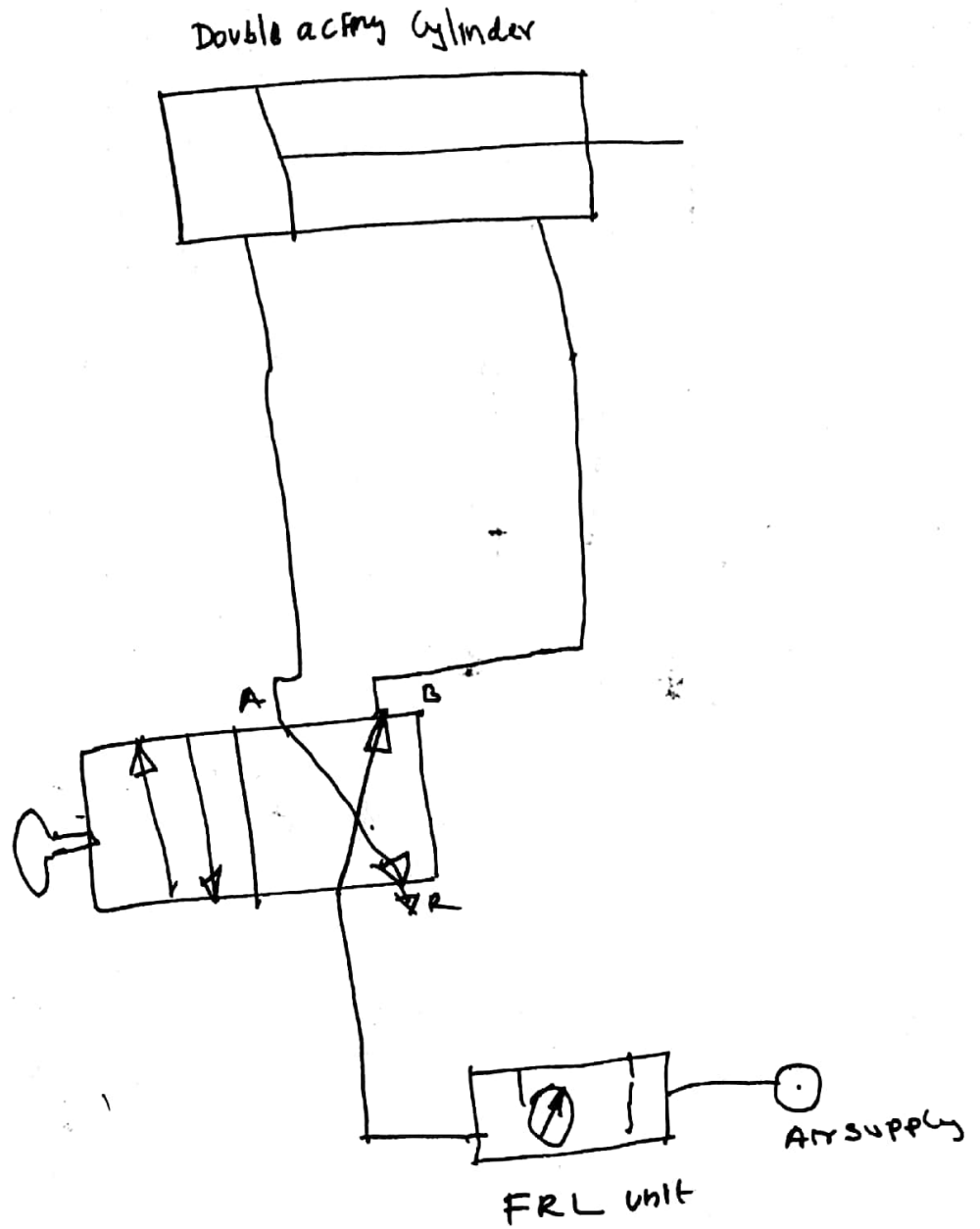
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meter out circuit



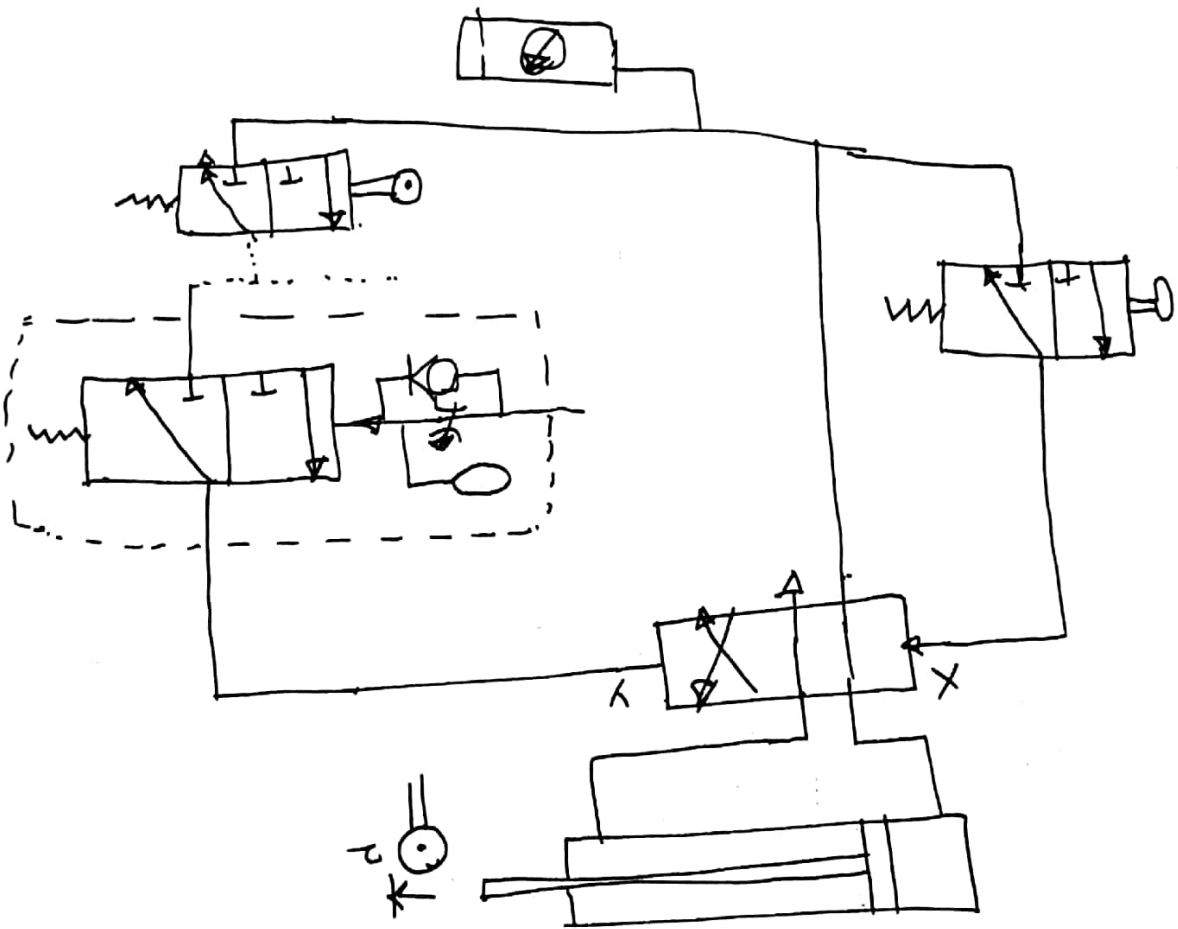
Bleed off circuit:

The fluid power circuit, which the flow control valve is not installed directly in the feed line, but on a by pass line is called bleed off circuit.

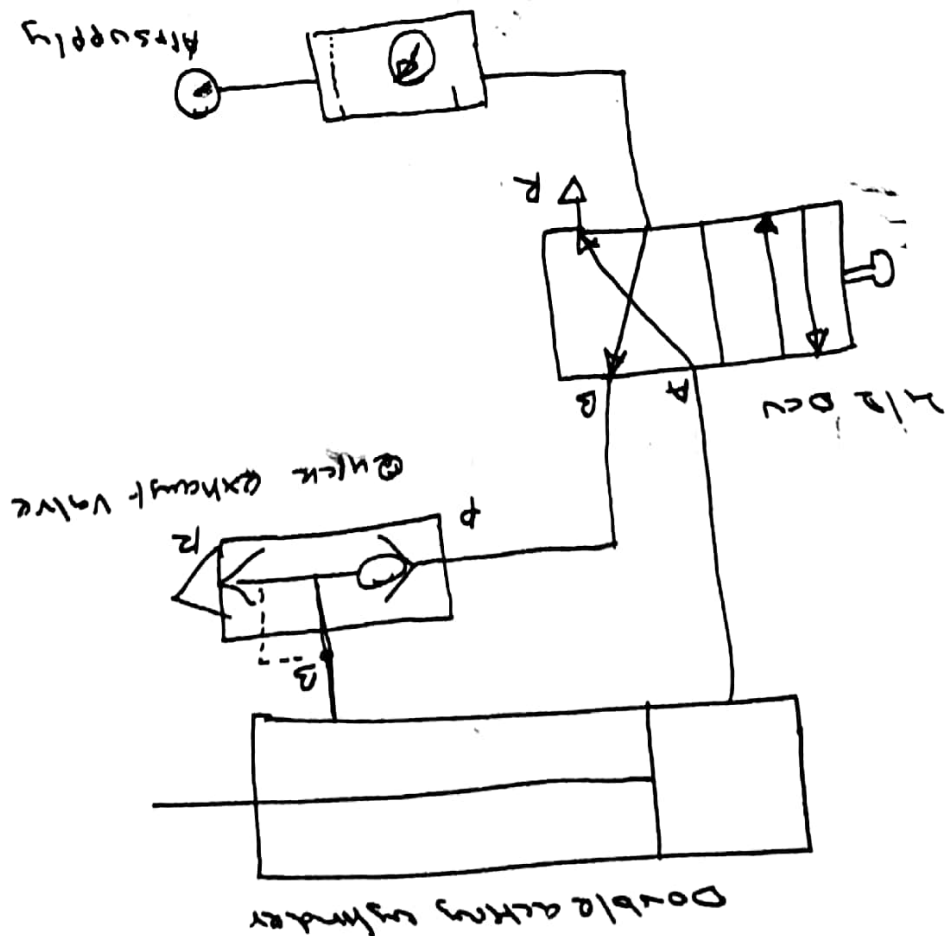


Design following pneumatic circuit following.

- (i) Quick exhaust circuit
- (ii) Time delay circuit.
- (iii) Two Step Feed Control circuit.



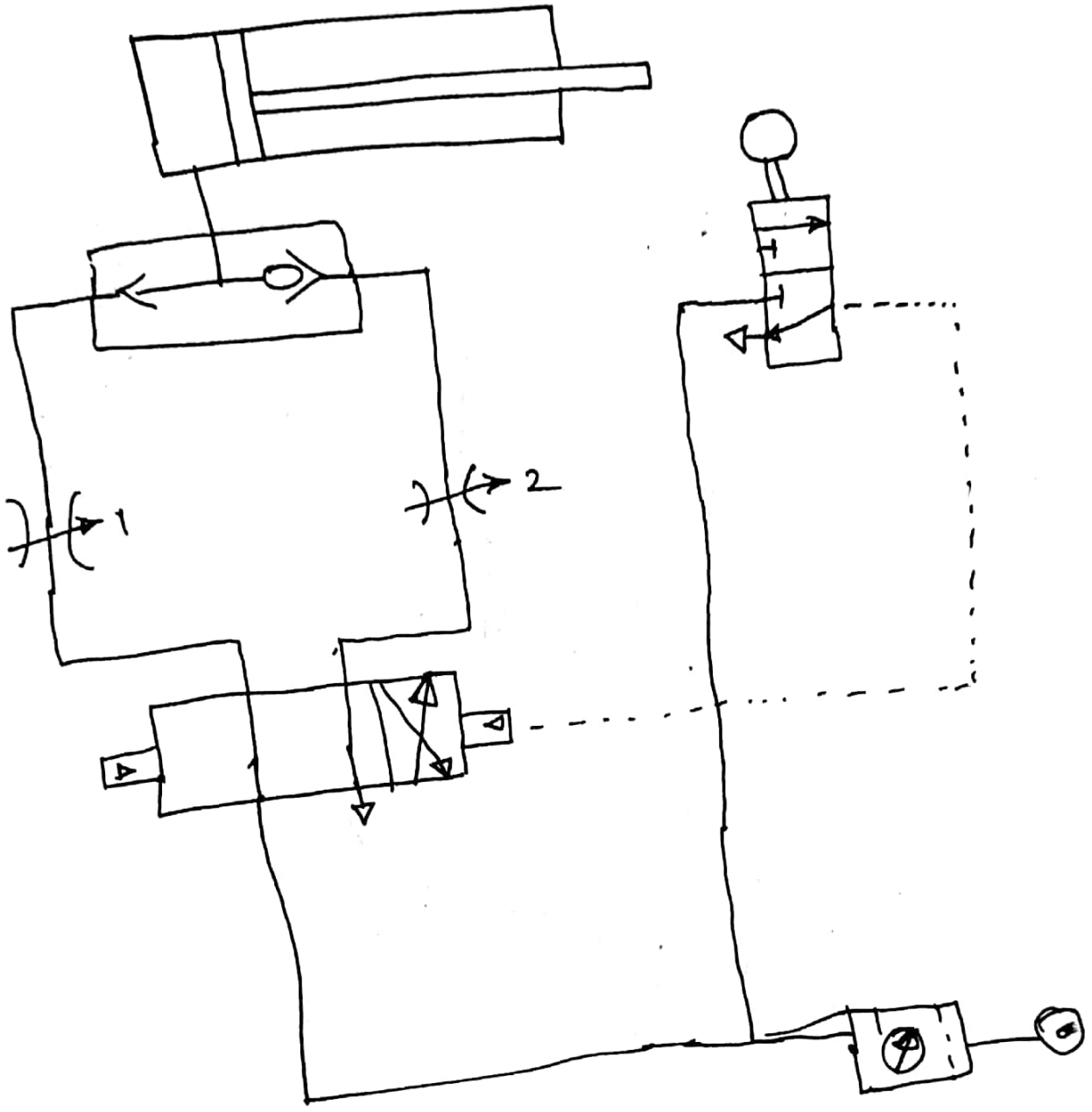
(ii) Time delay circuit.



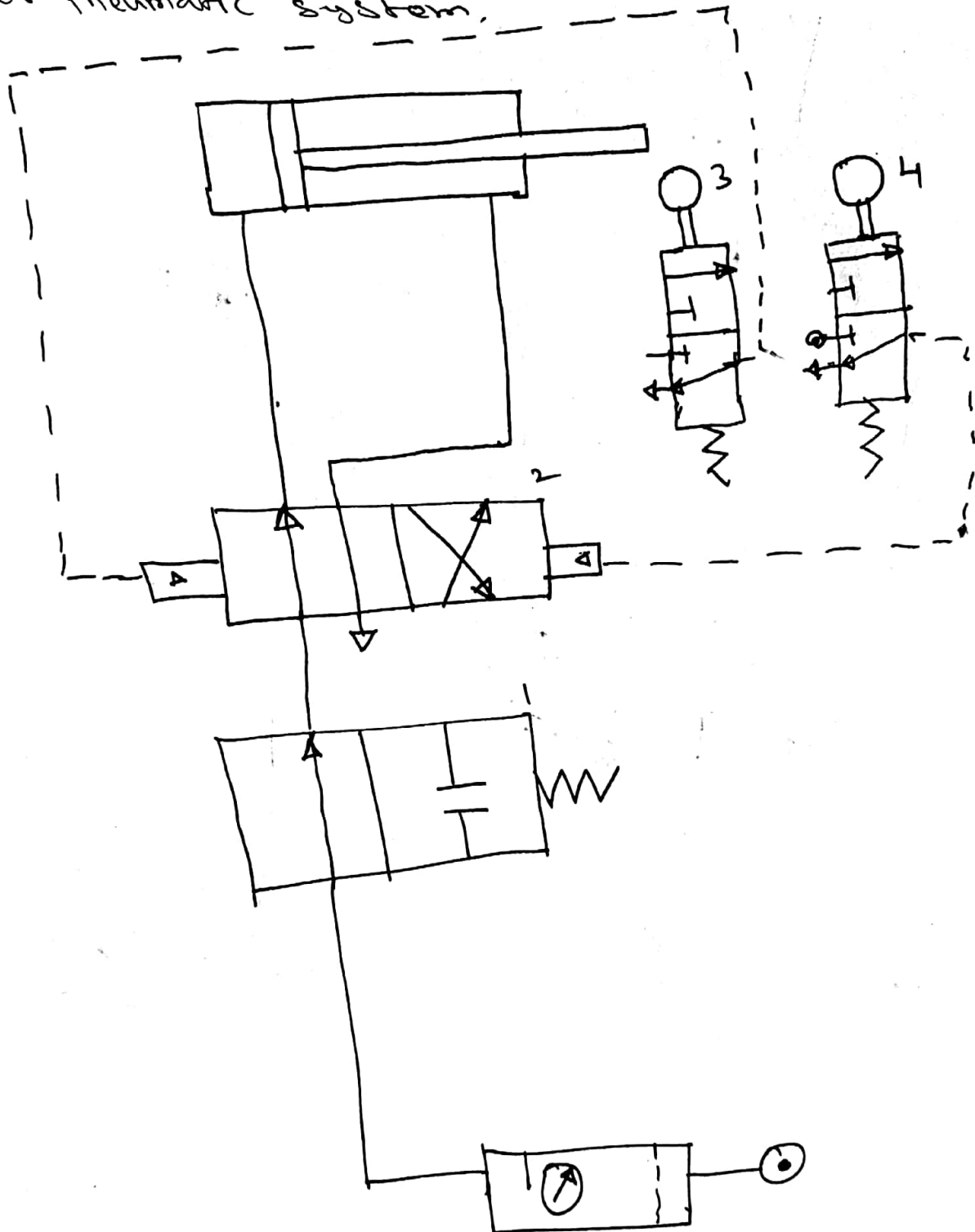
(i) Quick exhaust circuit

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Two step feed control



④ Design Automatic Cylinder Reciprocation Circuit for pneumatic system.



The Figure shows at pneumatic circuit connection of an automatic cylinder reciprocation system

The circuit consist of a FRL unit, a push button operated spring off centre 2/2 DCV (1), a pilot operated 4/2 DCV (2)

Two numbers of roller operated 3/2 DCV (2) & (4) and double acting pneumatic cylinder

* Valve 1 is the shut-off valve that makes or breaks fluid power to the system

* Valve-2 is the main direction control valve which direct the air flow to the cylinder for extension as well as retraction

* Valve-3 and valve-4 are pilot valves that give pilot signal to the main DCV for position selection.

③ Design sequence circuit for pneumatic system.

A sequence circuit is used to operate more than one actuator in a sequence order.

This circuit consists of a FRL unit, a manually operated spring offset centre 4/2 DCV; a Pumper operated spring offset centre 3/2 DCV, a double acting pneumatic cylinder (A) and a spring return single acting pneumatic system (B)

