

Final exam hydraulic

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2024

Q1

**Question Four (6pts)**

4. Given the following Hydraulic Press circuit with the following information: piston weight 200N, molten needed force 10000N, piston area  $10\text{cm}^2$ , rod area  $4\text{cm}^2$ , and pump flow rate  $10\text{m}^3/\text{hr}$ . For the nearby, find

- setting for the counter balance valve.
- Continue the pump circuit
- Piston speed
- Adjust the circuit to have a flow control
- Can you guess how much should be the PRV setting!

$P = 5000 \text{ kPa}$

$q_p = \frac{10 \text{ m}^3}{3600 \text{ s}} = 2.78 \times 10^{-3} \text{ m}^3/\text{s}$

$q_c = q_p + q_r$

Q2

Truth table

Q3

<https://www.careerride.com/view/design-of-pneumatic-circuits-mcqs-with-answers-23980.aspx>

# Q4

## Problem-5 (5pts)

Given the pneumatic bus door opener as shown:

1. Name the missing DCV valve: 5/2 DCV

2. Compute the generated cylinder force:

for retraction  $\rightarrow F = p * (A - a)$

for extension  $F = p * A$

3. If one wants to create a delay of 2seconds then we should use delay operator

4. Give the name of the push button valve that is used: 3/2 DCV

5. If the compressor flow rate was  $1 \text{ m}^3/\text{min}$ , what would be the door angular speed:  $V = \frac{Q}{A} \sim \frac{1 \text{ m}^3/\text{min}}{5 \text{ s}}$

6. Name the cylinder used in the pneumatic circuit: Double acting cylinder

7. To make this circuit electro-pneumatic one needs to use a: solenoid DCVs

