

# Quiz 1

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## Assignment Content



### ✓ Question 1

1 / 1

A hydraulic cylinder with diameter 0.75 inch and a stroke length of 12 inches is used to lift a 20 lb carton. Calculate the required oil pressure.

**Your Answer:** 45.3

**Correct**

The answer is **45.3 ± 1**.

### ✓ Question 2

1 / 1

A hydraulic press is used to apply 500 lbs of force to press fit an assembly. The cylinder has a 2" piston and 1.5" rod, and a 16" stroke length. What flow rate (in gpm) is required to extend the press in 6 seconds?

**Your Answer:** 2.2

**Correct**

The answer is **2.2 ± 1**.

### ✓ Question 3

1 / 1

A hydraulic cylinder is used to lift a load of 2,500 lbs. The maximum system pressure of 1500 psi. What cylinder size is required? (in other words, what is the diameter of the cylinder required?)

**Your Answer:** 1.5

**Correct**

The answer is **1.5 ± 1**.

### ✓ Question 4

1 / 1

A pump with a volumetric displacement of 4 in<sup>3</sup>/rev runs at 3600 rpm and produces 1500 psi. The actual flow rate is 59 gpm. What is the volumetric efficiency of this pump? Enter a whole number percentage.

**Your Answer:** 94

**Correct**

The answer is **95 ± 1**.

### ✓ Question 5

1 / 1

In 4 ports, 3 position closed center DCV

Hide answer choices ^

☒ (A) pump line is blocked and pump's flow must go over the relief valve

☐ (B) the pump is not connected to the system and the flow must go over the relief valve

- ☐ B the outlet lines to the cylinder are blocked, so the cylinder will be held firmly in position
- ☐ C none of these
- ☒ D Correct: all of these Correct answer
- ☐ E the pump is always operating under load

☒ Question 6

0 / 1

A cylinder is configured with a flow control valve to meter-out during extension. The cylinder is a 2" bore and 1" rod. The pump flow rate is 5 gpm with a pressure reducing valve set to 1500 psi. The load is 500 lbs. If the extension speed is to be limited to 10 in/s, what pressure would be measured on the retraction side of the cylinder, during extension? Enter a whole number.

Your Answer: 212

**Incorrect**

The answer is **1,788 ± 10**.

☒ Question 7

1 / 1

Calculate the Hydraulic HP of a hydraulic parts sorter that operates at 2500 psi and a flow rate of 45 gpm.

Your Answer: 65.6

**Correct**

The answer is **65.6**.

☒ Question 8

1 / 1

A pump has a displacement volume of 6 in<sup>3</sup>. It delivers 24 gpm at 1000 rpm and 1000 psi. If the prime mover input torque is 1100 in • lb, what is the theoretical torque required to operate the pump in in-lbs?

Your Answer: 954.9

**Correct**

The answer is **955 ± 1**.

☒ Question 9

1 / 1

Speed is pressure dependent in hydraulic systems.

☐ T True

☒ F False Correct answer

☒ Question 10

1 / 1

An external gear pump has the following dimensions:

Inside teeth diameter = 1 in

Outside teeth diameter = 2 in

Teeth width = 0.75 in

Calculate the volumetric displacement of this pump.

**Your Answer:** 1.8

**Correct**

The answer is **1.8 ± 1**.

✖ Question 11

0 / 1

Hydraulic fluid flows at velocity of 200 in/min through a conduit with an internal diameter of 2 inches. Determine the flow rate in GPM. Be aware of your units!

**Your Answer:** 9795.7

**Incorrect**

The answer is **2.7 ± 1**.

✔ Question 12

1 / 1

Which pump type is best suited for the following situation?  
The pump operates in a dirty and noisy environment, with moderate pressure and flow requirements.

Hide answer choices ^

✔ **Correct: Gear**

Correct answer

Ⓑ Piston

Ⓒ Vane

✔ Question 13

1 / 1

What type of DCV is best suited for a single acting cylinder?

Hide answer choices ^

Ⓐ four-way, three-position, closed center

Ⓑ shuttle valve

Ⓒ two-way, normally passing

✔ **Correct: three-way, two-positions, spring return**

Correct answer

✔ Question 14

1 / 1

A hydraulic pump which can be adjusted for different amounts of flow are called:

Hide answer choices ^

Ⓐ a pump that can be adjusted

✔ **Correct: Variable displacement pump**

Correct answer

☐ C Depends on type of pump

☐ D Fixed displacement pump

✓ Question 15

1 / 1

A hydraulic press is used to apply 500 lbs of force to press fit an assembly. The cylinder has a 2" piston and 1.5" rod, and a 16" stroke length. What flow rate (in gpm) is required to retract the press in 0.75 seconds?

Your Answer: 7.6

Correct

The answer is **7.6 ± 1**.

✓ Question 16

1 / 1

What is the pressure head of oil (ft) in a vertical pipe if the pressure reading is 10 psi and the liquid is Gasoline with a specific weight of 42.2 lb/ft<sup>3</sup>?

Your Answer: 34.1

Correct

The answer is **34.1 ± 1**.

✗ Question 17

0 / 1

Bernoulli's Energy Equation tells us that

Hide answer choices ^

☐ A Friction losses do not need to be considered

☒ B The energy between any 2 points is balanced when considering added and lost energy

Correct answer

☐ C All the energy put in by the pump is used to move the load

☐ D Incorrect: energy everywhere in a hydraulic system is the same

✗ Question 18

0 / 1

A tandem center condition stops actuator's motion, but allows pump flow to return to tank while a system is idling.

☒ T True

Correct answer

☐ F Incorrect: False

✓ Question 19

1 / 1

The load on a 2-in.-diameter hydraulic cylinder increases from 10,000 lb to 15,000 lb. Due to the compressibility of the oil, the piston retracts 0.1 in. If the volume of oil under compression is 10 in<sup>3</sup>, what is the bulk modulus of the oil in units of kpsi? Enter only a whole number.

Your Answer: 50

Correct

The answer is  $51 \pm 1$ .

✗ Question 20

0 / 1

How much pressure is required to 'turn on' a one-directional valve (check-valve)?

Hide answer choices ^

☐ A full system pressure

☐ B about 100-200 psi

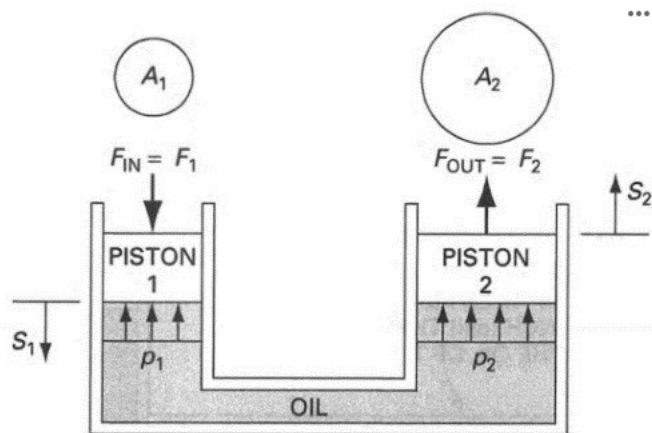
☒ C Incorrect: depends on the flow rate

☐ D about 10-20 psi

Correct answer

✓ Question 21

1 / 1



Consider the hydraulic lifter shown where  $A_1 = 3.2 \text{ in}^2$  and  $A_2 = 9.1 \text{ in}^2$ , and the applied force  $F_{IN} = 125 \text{ lbs}$ . How far must Piston 1 be pushed to lift Piston 2 by 3 in?

Your Answer: 8.5

Correct

The answer is  $8.5 \pm 1$ .

✓ Question 22

1 / 1

Which pump type is best suited for the following situation?

The hydraulic circuit requires high pressure and high flow rate and must operate under rough conditions for many years.

Hide answer choices ^

☒ Correct: Piston

Correct answer

(B) Vane

(C) Gear

✓ Question 23

1 / 1

A hydraulic fluid has a specific weight of 55 lb/ft<sup>3</sup>. What is its specific gravity?

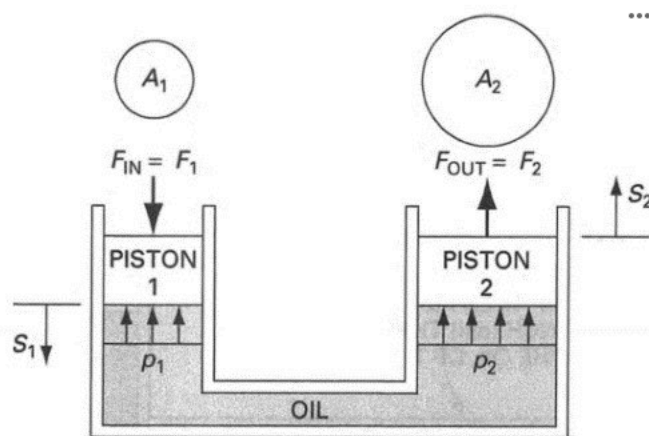
Your Answer: 0.9

Correct

The answer is **0.9 ± 1**.

✓ Question 24

1 / 1



Consider the hydraulic lifter shown where  $A_1 = 3.2 \text{ in}^2$  and  $A_2 = 9.1 \text{ in}^2$ , and the applied force  $F_{in} = 125 \text{ lbs}$ . What is the output force  $F_2$ ?

Your Answer: 355.5

Correct

The answer is **355.5 ± 1**.

✗ Question 25

0 / 1

What would happen to the speed of a cylinder during extension, if piston diameter is increased while keeping pressure and pump gpm constant?

Hide answer choices ^

✗ Incorrect: increase

(B) stay the same

(C) it depends on the fluid type

(D) decrease

Correct answer

