

# USPS 955

# Free Practice Test

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\* The correct answers and explanations are located at the end of this PDF.

## Part 1 - Multicraft

### #1 Pneumatics

If the fluid discharge of an air-operated double-diaphragm pump is completely shut off while the pump is running, what is the most likely outcome?

- A. The pump will continue cycling at a slower rate.
- B. The pump will stall and stop moving.
- C. The pump will run in reverse due to pressure buildup.
- D. The pump's diaphragms will rupture from excessive pressure.

### #2 Welding

A welder is making the first weld in a pipe joint. What key factor ensures the success of the root pass?

- A. Using the correct electrode angle and heat settings
- B. Relying solely on gravity to distribute the weld metal
- C. Skipping the root pass and starting with a fill pass
- D. Welding the entire joint in a single pass

### #3 Power Transmission

Why does a single-rod double-acting piston generate greater force in one direction?

- A. Because pressure is higher during extension
- B. Because retraction eliminates resistance
- C. Because both sides experience equal force
- D. Because the rod reduces the effective piston area on one side

### #4 Power Transmission

A worker installs a smaller-than-recommended grinding wheel onto a high-speed grinder. What is the potential risk?

- A. The wheel may overheat and fail
- B. The wheel may spin too slowly to be effective
- C. The tool rest will need constant adjustment
- D. There is no significant risk

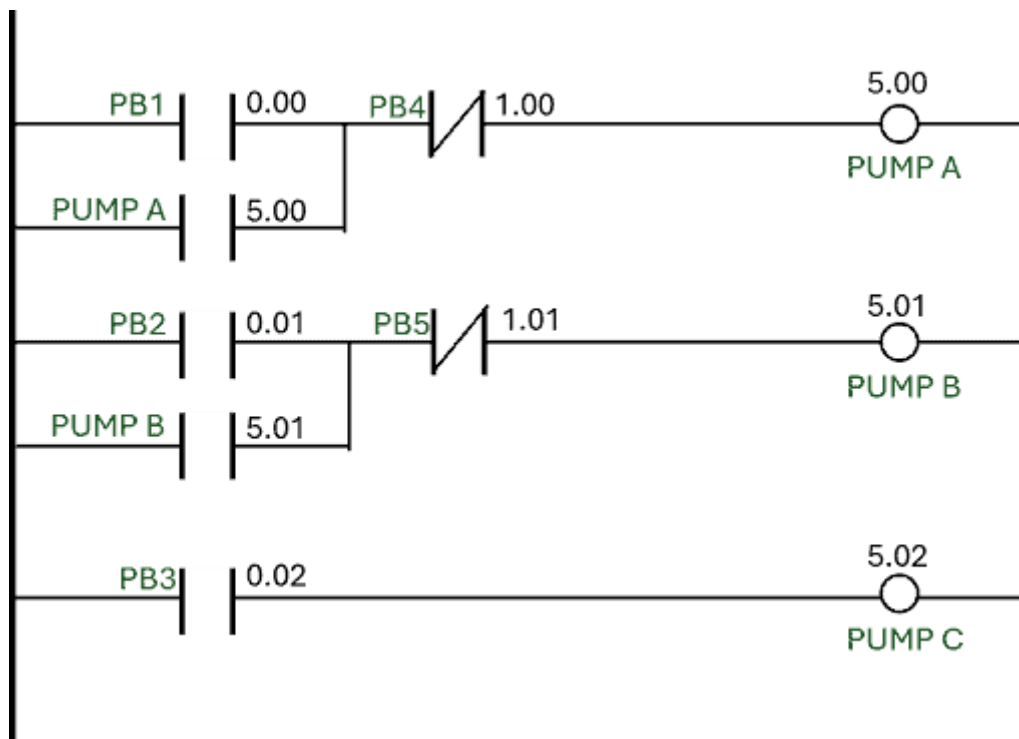
## #5 Pumps

A vane pump is experiencing excessive wear on the vanes. What could be the primary reason?

- A. Excessively high fluid temperature
- B. Low discharge pressure
- C. Contaminants in the fluid
- D. Oversized pump housing

## #6 Control Circuits

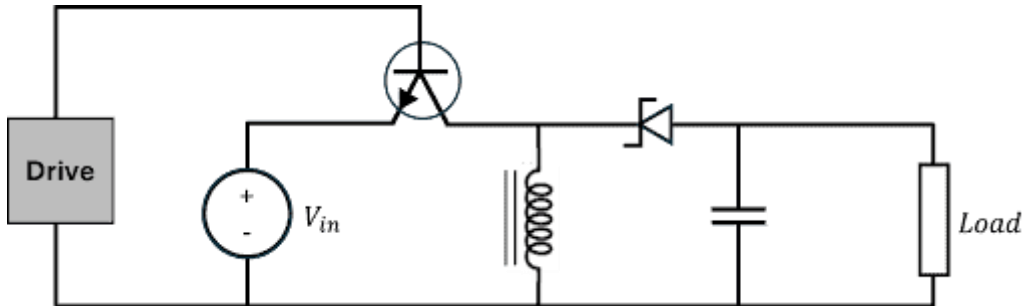
Which of the following statements is not true?



- A. Pump A remains on even after releasing PB1.
- B. Pump B remains on even after releasing PB2.
- C. Pump C remains on even after releasing PB3.
- D. PB4 and PB5 are emergency stop buttons.

## #7 Power Supplies

When the switch in the inverting converter is ON, what immediate effect occurs across the output capacitor and why?



- A. The output capacitor charges positively as current flows directly from input
- B. The output voltage increases due to energy transfer from the inductor
- C. The capacitor holds its charge; the inductor is isolated from the load
- D. The diode becomes reverse-biased and isolates the output, maintaining negative voltage

## #8 Motors

What happens to the phase sequence when the reversing contacts of a motor starter are engaged?

- A. It reduces the motor voltage.
- B. It swaps any two of the three supply lines.
- C. It increases the motor frequency.
- D. It energizes both forward and reverse contactors simultaneously

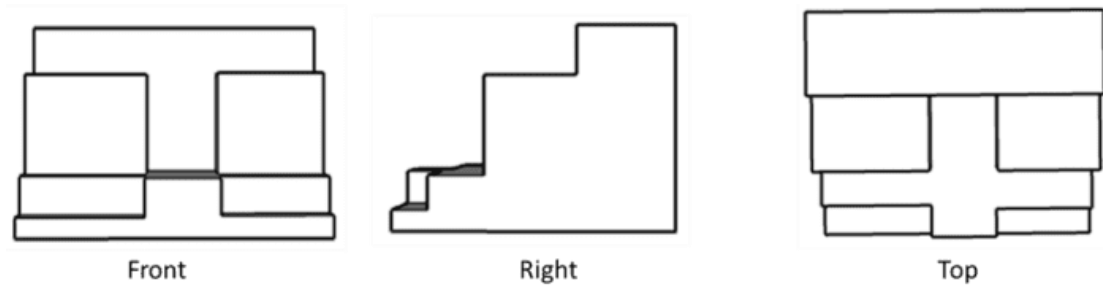
## #9 Power Distribution

What is the main advantage of alternating current (AC) over direct current (DC) in power distribution?

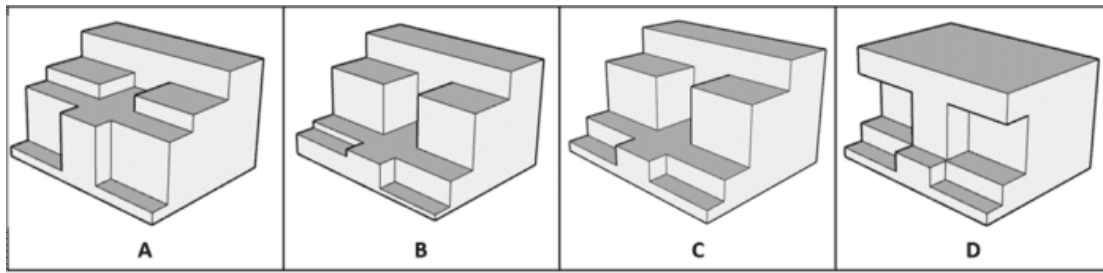
- A. AC systems allow easier voltage adjustments for transmission.
- B. AC can be generated efficiently using rotating machinery.
- C. AC is compatible with a wide range of industrial loads.
- D. AC can be transmitted over long distances with less energy loss.

## Part 2

### #10 Spatial Visualization



*Which of the following 3D shapes has the given front, right, and top views?*



### #11 Matching Parts & Figures



Choose the figure that combines these shapes, without gaps or overlap.



A

B

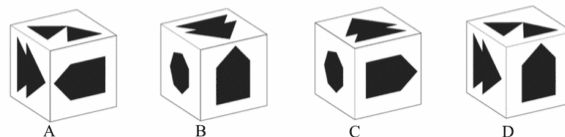
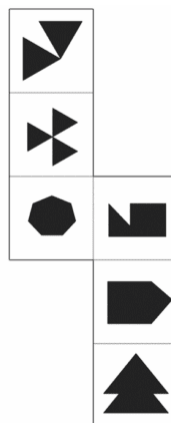


C

D

### #12 Matching 2D to 3D Shapes

Match the given 2D shape to its corresponding 3D shape in the answer choices.



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## Correct Answers & Explanations

### **#1 Pneumatics**

The correct answer is B. The pump will stall and stop moving.

This happens because AODD pumps rely on compressed air to cycle the diaphragms, and when the discharge is blocked, pressure builds up in the pump chamber, preventing further diaphragm movement.

Unlike centrifugal pumps, AODD pumps do not generate excessive pressure beyond the air supply pressure, so they do not rupture or run in reverse.

Once the discharge is reopened, the pump will resume operation without damage.

### **#2 Welding**

The correct answer is A. Using the correct electrode angle and heat settings.

The root pass establishes the foundation of the weld, so proper technique is crucial.

An incorrect electrode angle or heat setting can result in incomplete fusion, undercutting, or burn-through. Maintaining a steady hand and controlling heat input ensures a strong, well-penetrated root pass.

### **#3 Power Transmission**

The correct answer is D. Because the rod reduces the effective piston area on one side.

In a single-rod double-acting cylinder, the extension stroke has a larger effective surface area since it pushes against the full face of the piston.

During retraction, the rod takes up space, reducing the working area, which decreases the force generated for the same pressure.

This difference in piston area means the extension stroke can exert more force than the retraction stroke.

The pressure remains the same, but the force is determined by the area on which it acts.

#### **#4 Power Transmission**

The correct answer is A. The wheel may overheat and fail.

While smaller grinding wheels can handle higher RPMs, using an undersized wheel on a high-speed grinder can lead to excessive friction and localized overheating.

Overheating can cause the bonding material to weaken, leading to wheel failure or breakage. Additionally, smaller wheels may not provide the same cutting efficiency or durability as properly matched sizes.

To ensure safe operation, always use a wheel rated for the grinder's RPM and application.

#### **#5 Pumps**

The correct answer is C. Contaminants in the fluid.

Vane pumps rely on smooth, tight-fitting vanes that slide within slots, and contaminants such as dirt or metal particles can cause abrasive wear.

This wear reduces efficiency and increases maintenance costs. Proper filtration is necessary to prevent contaminants from entering the pump system.

#### **#6 Control Circuits**

The correct answer is C. Pump C remains on even after releasing PB3.

A latching circuit, also known as a seal-in circuit, is designed to keep a device like a pump or motor running even after the start button is released.

In the diagram, both Pump A and Pump B use this setup by including an auxiliary contact (labeled Pump A or Pump B) in parallel with the push button, allowing the circuit to stay energized once the pump is turned on.

However, Pump C does not include a latching contact, so it only runs while PB3 is actively pressed and turns off immediately when released.

Therefore, the statement that “Pump C remains on even after releasing PB3” is not true.

### **#7 Power Supplies**

The correct answer is D. The diode becomes reverse-biased and isolates the output, maintaining negative voltage.

When the switch is ON, the inductor stores energy from the input supply. During this time, the diode is reverse-biased due to the potential at the cathode being more negative than the anode, effectively isolating the load.

The output capacitor maintains the negative voltage, supplying current to the load while the inductor builds magnetic energy.

### **#8 Motors**

The correct answer is B. It swaps any two of the three supply lines.

A reversing motor starter changes the direction of a three-phase motor by swapping any two of the three incoming power lines. This alteration changes the phase sequence, which reverses the rotating magnetic field in the stator.

As a result, the motor’s rotor turns in the opposite direction. Reversing starters are carefully designed to prevent both contactors from being energized at the same time to avoid short circuits.

### **#9 Power Distribution**

The correct answer is D. AC can be transmitted over long distances with less energy loss.

The key advantage of alternating current (AC) in power distribution is its ability to be transmitted efficiently over long distances.

AC voltage can be stepped up or down using transformers, which operate only with alternating current.

When the voltage is stepped up, the current decreases, and lower current means less energy lost as heat in transmission lines.

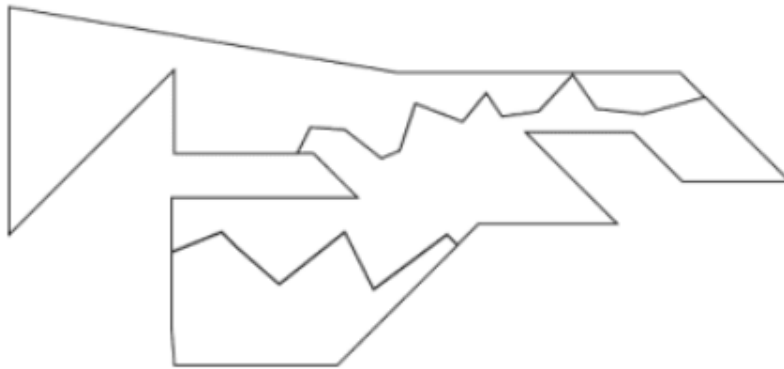
This makes AC far more practical for regional and national power grids than direct current.

### **#10 Spatial Visualization**

The correct answer is C.

### **#11 Matching Parts & Figures**

The correct answer is C.



### **#12 Matching 2D to 3D Shapes**

The correct answer is D.

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