ASVAB-SECTION-3Q&As

ASVAB Section Three : Mechanical Comprehension

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QUESTION 1

What determines the speed of a pulley system?

A. The material used as the belt (such as leather and rubber).

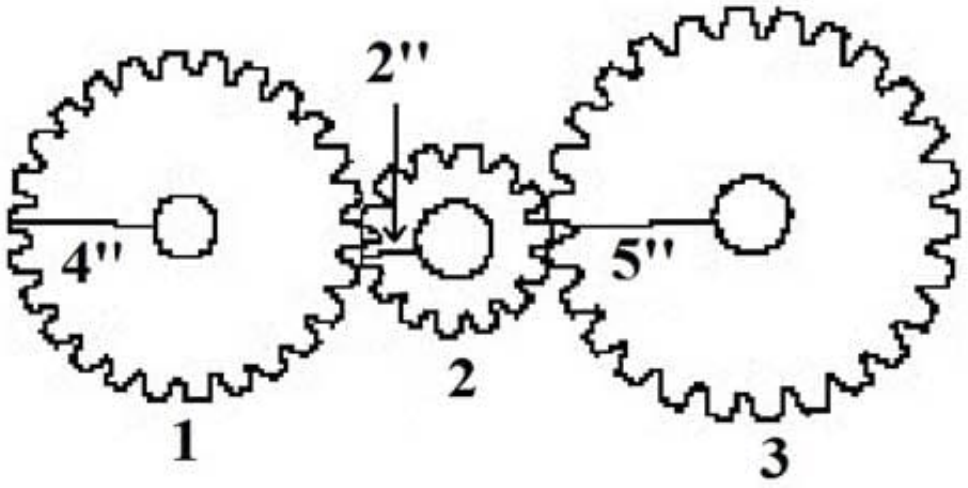
B. The size of the pulleys as a whole.

C. The size and ratio of all pulleys involved.

D. The length of the rope or belt used in the pulley system.

Correct Answer: C

QUESTION 2



If Gear 1 in the figure above makes 10 complete clockwise revolutions per minute, then _____.

A. Gear 2 makes 2 clockwise revolutions per minute.

B. Gear 3 makes 8 clockwise revolutions per minute.

C. Gear 3 makes 30 clockwise revolutions per minute.

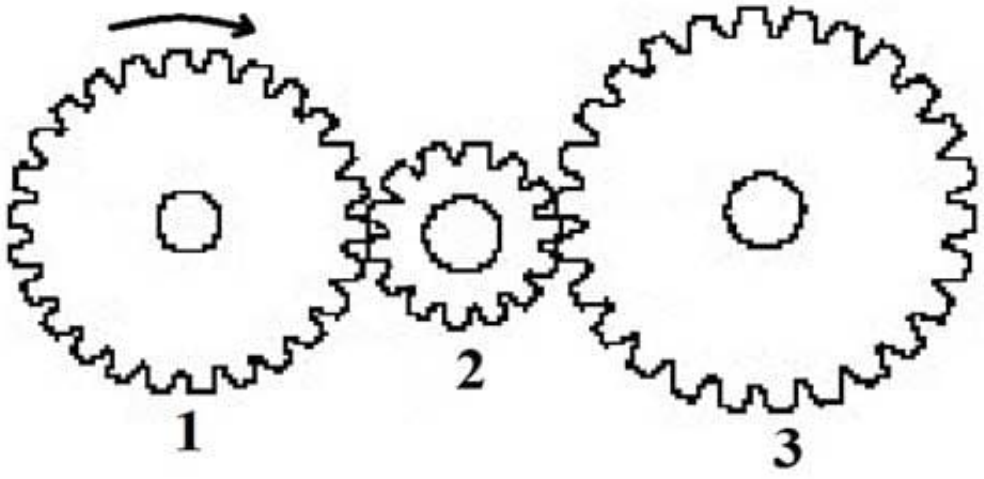
D. Gear 3 makes 9 counterclockwise revolutions per minute.

Correct Answer: B

Gear 1 makes 10 clockwise revolutions per minute. Gear 2, which is half the size, makes 20 counterclockwise revolutions per minute. (The number of revolutions it makes is inversely proportional to its difference in size.) Gear 2 is half the size of Gear 1, so to determine the number of revolutions it makes, multiply the number of revolutions Gear 1 makes by the inverse of 1?2: 10 × 2?1 (or just 2) = 20. Gear 3 is 2.5 times the size of Gear 2. In other words, it is 5?2 the size of Gear 2. To determine the number of revolutions Gear 3 makes, multiply the inverse of 5?2 by the number of revolutions Gear 2 makes: 2?5 × 20. This can be stated as 20?1 (the number of revolutions Gear 2 makes per minute) × 2?5 (the fraction of revolutions Gear 3 makes) = 40?5 or 8 revolutions per minute.

QUESTION 3

Which of the other gears is moving in the opposite direction from Gear 1?



A. Gear 2

B. Gear 3

C. Both Gears 2 and 3

D. Neither Gear 2 or 3

Correct Answer: A

Meshed gears turn in opposite directions.

Gear 1 is turning clockwise; therefore. Gear 2 is turning counterclockwise (the opposite direction from Gear

1) and Gear 3 is turning clockwise (the same direction as Gear l).

QUESTION 4

Water flows into a container at a rate of 140 gallons per minute. The container has a small opening at the bottom that drains water at a rate of 1 gallon per second.

How long will it take to fill the container to 240 gallons?

A. 2 min

B. 3 min

C. 4 min D. Not enough information

Correct Answer: B

The opening drains water at 1 gallon/second which is equivalent to 60 gallons/min. Therefore, the net gain

of water is 140 gallons/min - 60/gallons/min = 80 gallons/min.

To fill 240 gallons at a rate of 80 gallons/min will take 3 minutes.

QUESTION 5

Universal joints are used to _____.

A. connect ball bearings

B. fix two shafts so they don\\'t pivot or rotate

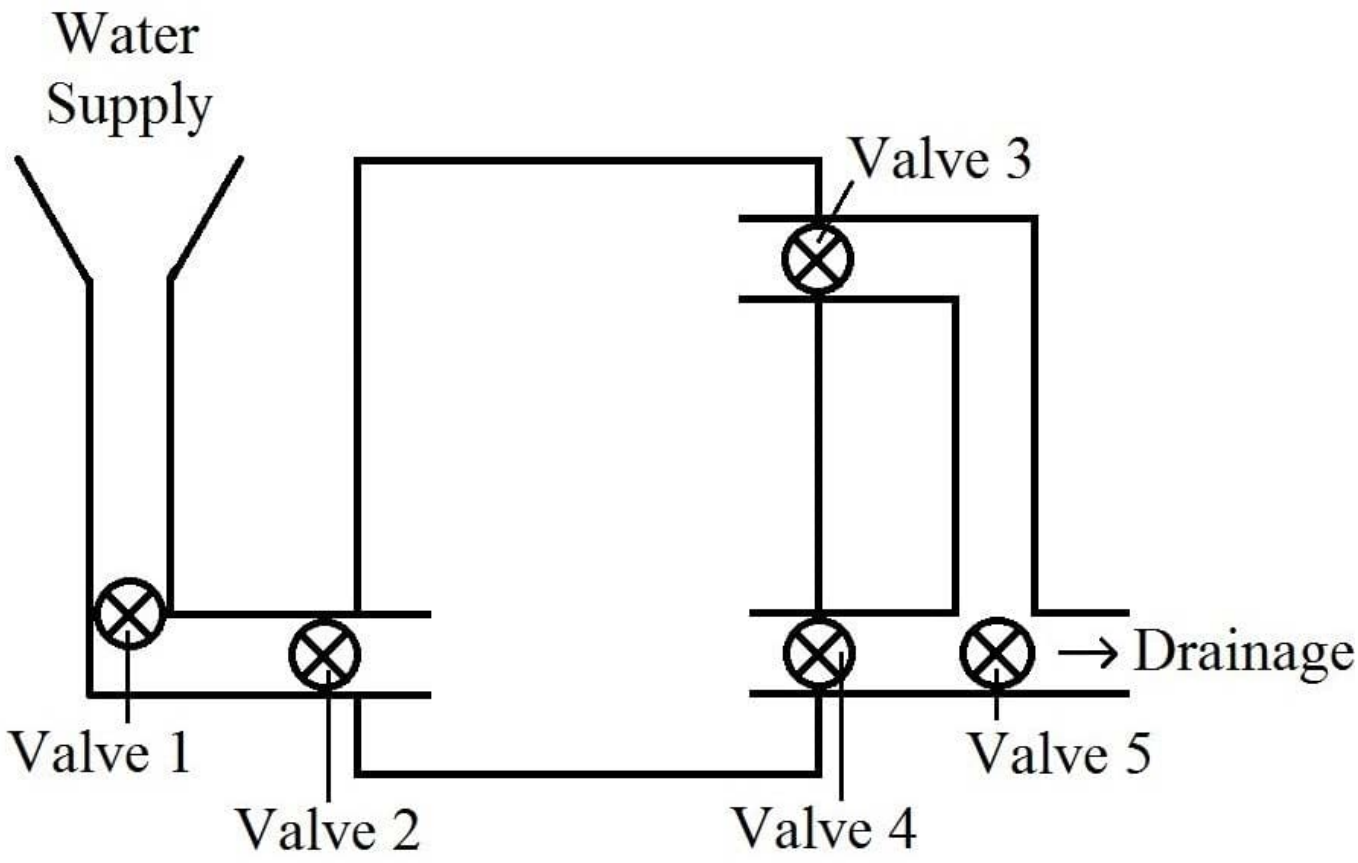
C. connect shafts in a U-shape

D. couple two shafts set at different angles

Correct Answer: D

Universal joints are used to connect shafts that aren\\'t in the same plane.

QUESTION 6



In the figure above, assume the valves are all closed. Which valves need to be open to fill the tank entirely?

A. 1 and 2 only

B. 1 only

C. 1, 2, and 3

D. 2 only

Correct Answer: A

Valves 1 and 2 need to be open to fill the tank.

QUESTION 7

Helical gears have _____.

A. straight teeth

B. slanted teeth

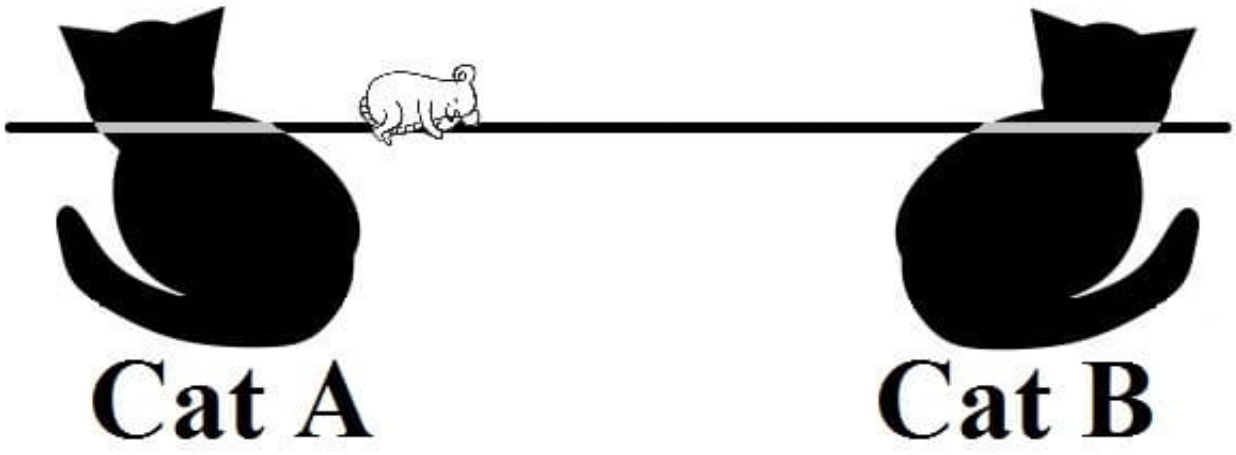
C. teeth of unequal size

D. no advantage over spur gears

Correct Answer: B

The teeth of helical gears are slanted.

QUESTION 8



The weight of the load is being carried on the backs of the two cats shown in the figure. Which cat is carrying the most weight?

A. Cat A

B. Cat B

C. Both are carrying an equal amount of weight.

D. It can\\'t be determined without more information.

Correct Answer: A

The load is closer to Cat A, so he\\'s carrying the greater portion of the weight.

QUESTION 9

Wheel A has a diameter of 10 feet. Wheel B has a diameter of 8 feet.

If both wheels revolve at the same rate, Wheel B will cover a linear distance of 16 feet _____.

A. at the same time as Wheel A

B. more slowly than Wheel A

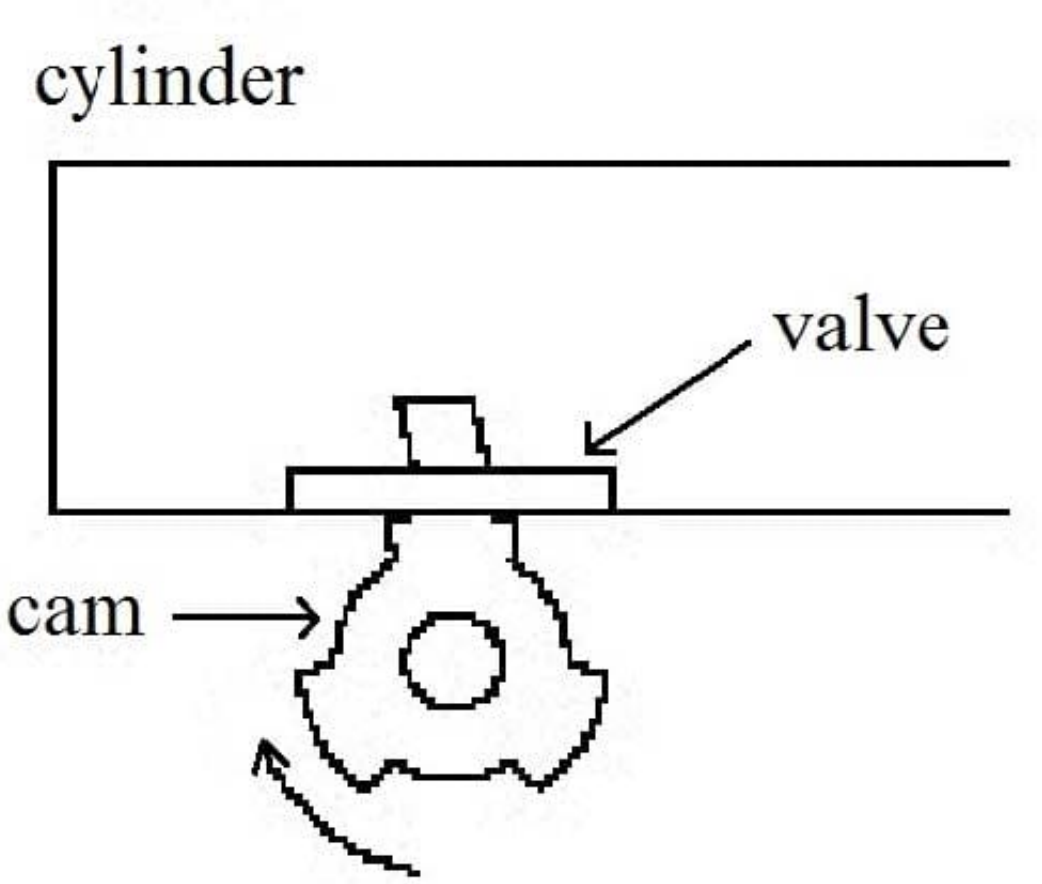
C. in twice the time as Wheel A

D. faster than Wheel A

Correct Answer: B

Wheel B has to make more revolutions than Wheel A to cover the same amount of distance, so it will go slower.

QUESTION 10



In the figure above, for each complete revolution the cam makes, how many times will the valve open?

A. 1

B. 6

C. 3

D. 2

Correct Answer: C

The valve will open each time a high point of the cam hits it. The cam has three high points, so the valve will open three times per revolution.

QUESTION 11

Which of the following is not a simple machine?

A. Lever

B. Inclined plane

C. Axe

D. Pulley

Correct Answer: C

An axe is a compound machine: the handle is a lever, and the head is two inclined planes (each side of the blade edge).

QUESTION 12

Which mechanical components are typically used between a wheel and an axle to reduce friction?

A. springs

B. hinges

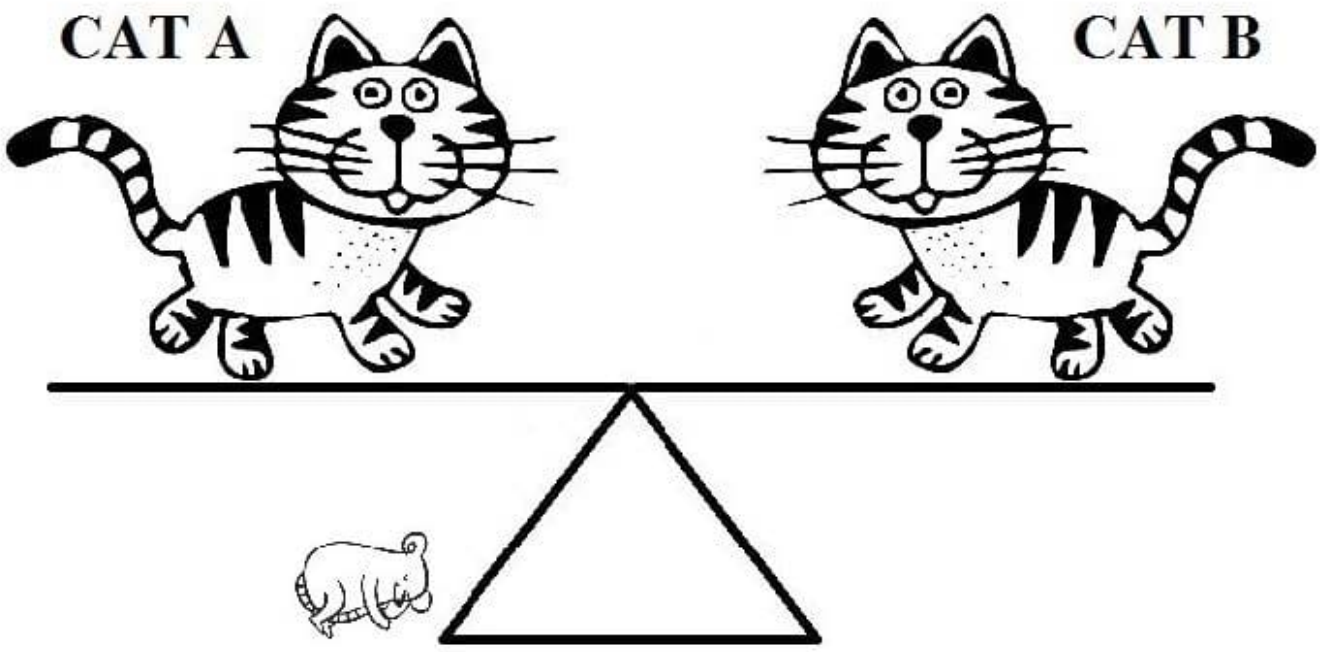
C. bearings

D. levers

Correct Answer: C

A set of bearings is typically a set of small metal balls packed in a groove and lubricated with grease or oil. The wheel rubs against one side of each ball, and the axle rubs against the other side. The net effect is that the wheel rolls much more easily.

QUESTION 13



In the figure above, if Cat A moves toward the middle of the seesaw to get a better look at the mouse, Cat B will _____.

A. remain stationary

B. move toward the ground

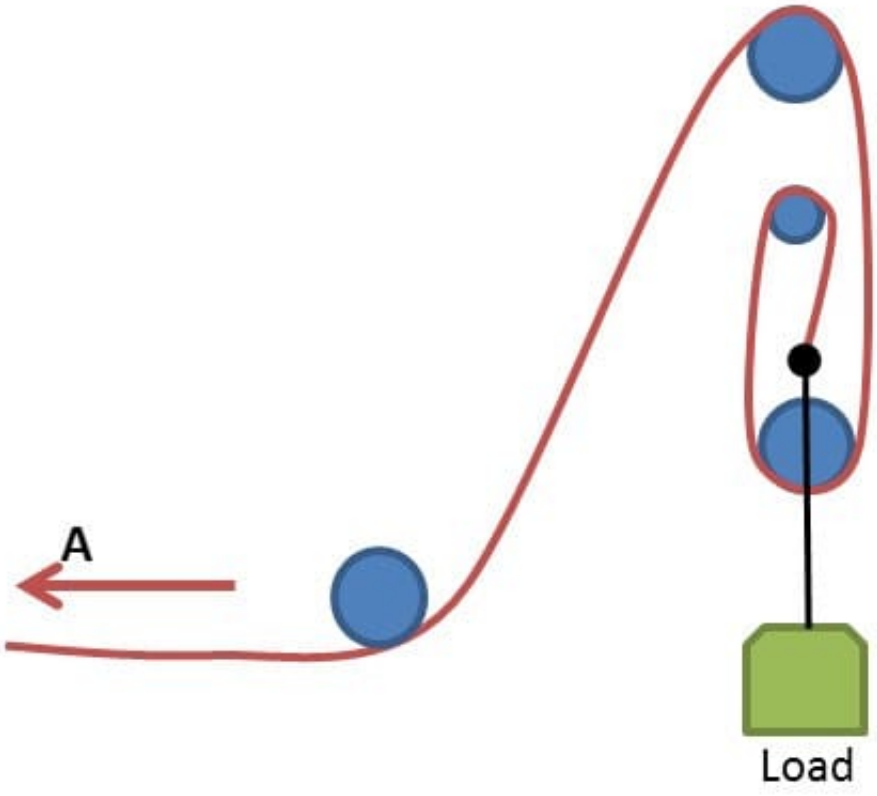
C. rise in the air

D. instigate a cat fight

Correct Answer: B

The Cat B will move towards the ground.

QUESTION 14



Pulling on the rope at point A will lift the load.

How far will you have to pull the rope at point A to lift the load 15 feet?

A. 15 feet

B. 45 feet

C. 30 feet

D. 60 feet

Correct Answer: B

The mechanical advantage of the pulley is 3 since there are three ropes supporting the load. Therefore, the distance at

point A needs to 3x or 3 × 15 = 45 ft.

QUESTION 15

When a football is thrown upwards in the air, what causes it to arc back towards the ground?

A. Centrifugal force

B. Gravity

C. Friction

D. Wind resistance

Correct Answer: B

Gravity is the force that causes objects to be pulled back towards the earth.