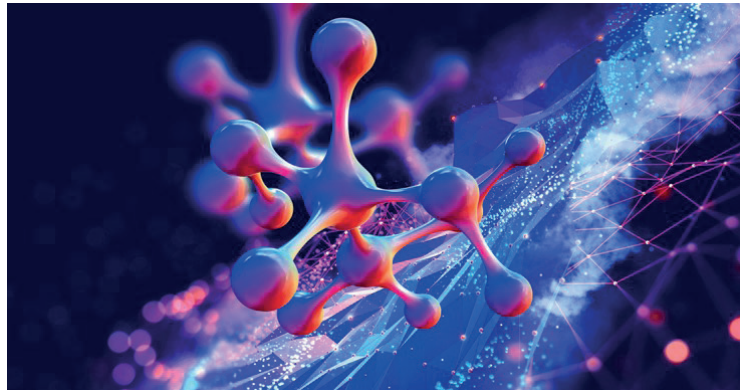




A company in India built solar panels over irrigation arcs.

Which of the following cannot be one of the potential advantages of doing so?

- A) Increased shade from the solar panels may reduce water evaporation from the arcs, potentially leading to water conservation.
- B) Solar panels can generate electricity, offering an additional source of revenue for the company.
- C) By using the space above irrigation arcs, the company can maximize land use for both agriculture and renewable energy production.
- D) The presence of solar panels may create additional maintenance costs, which can offset the financial benefits.



What is the primary focus of nanotechnology?

- A) Creating and studying giant structures.
 - B) Developing technology for space exploration.
 - C) Manipulating matter at a minuscule scale.
 - D) Producing materials that are macroscopic in size.
-



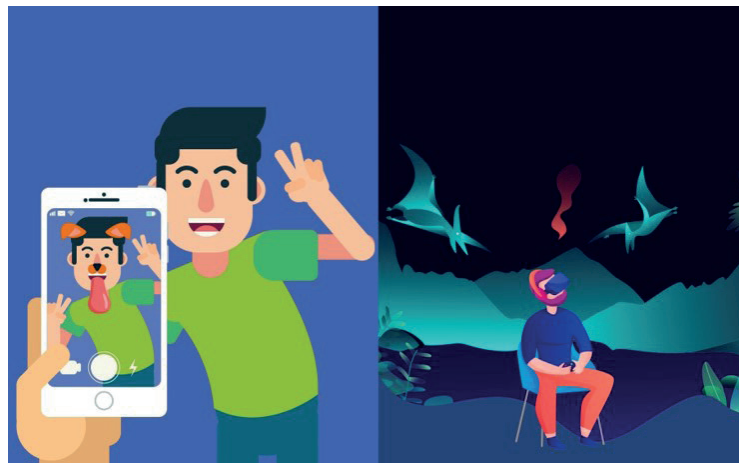
What is the primary purpose of genetic engineering?

- A) To create fictional stories about altering DNA.
- B) To develop new tools for biotechnology.
- C) To modify the genetic makeup of living organisms.
- D) To preserve endangered species in their natural habitats.



What is the main reason metals are used in a wide range of applications, from paperclips to cars?

- A) They are lightweight and easy to transport.
- B) They can withstand extreme temperatures.
- C) They are strong, shiny, and can conduct heat and electricity.
- D) They are made from natural materials like wood and cotton.



What is one key difference between Virtual Reality (VR) and Augmented Reality (AR)?

- A) VR immerses you in a completely digital world, while AR adds digital elements to the real world.
- B) VR uses social media filters, while AR relies on special headsets.
- C) VR is only used for gaming, while AR is used for medical procedures.
- D) VR and AR are the same and can be used interchangeably.



Which of the following statements is true about electric cars?

- A) They run on gasoline
- B) They emit more CO₂ than gasoline-powered cars
- C) They require longer charging time than refueling time for gasoline-powered cars
- D) They are less energy-efficient than gasoline-powered cars



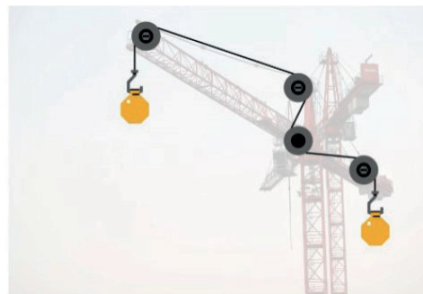
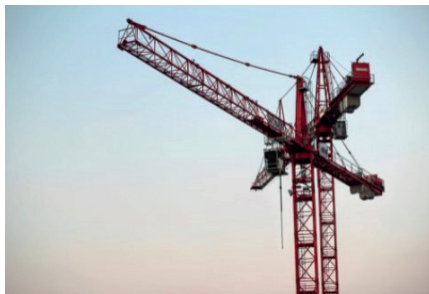
Which of the following best describes an autonomous car?

- A) A car that is driven by a robot
- B) A car that can drive itself without human control
- C) A car that can only be driven by adults
- D) A car that is powered by electricity



What is artificial intelligence?

- A) The study of the natural world and its phenomena
- B) The science of creating machines that can perform tasks that typically require human intelligence
- C) The study of the structure, behavior, and interactions of natural systems
- D) The branch of science that deals with the properties, composition, and structure of matter

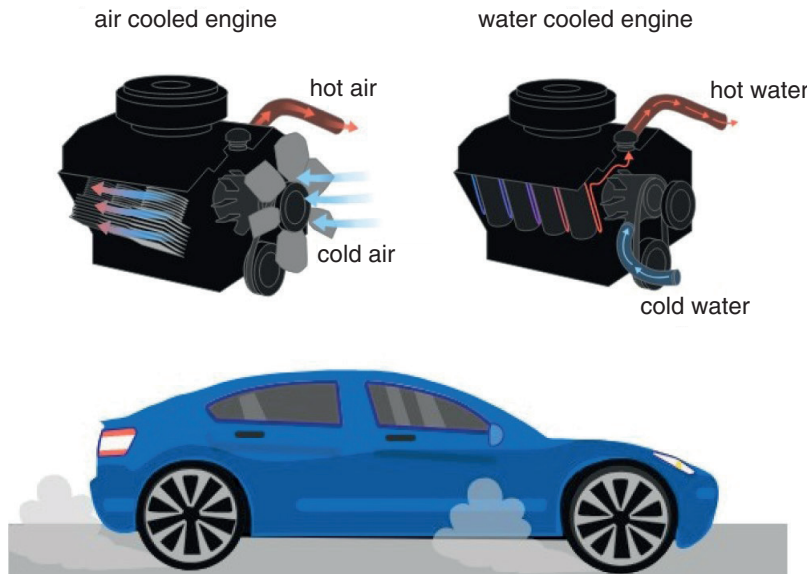


Tower cranes are essential for moving heavy goods, materials or tools around a site. They're great for speeding up construction, saving time and manpower. Tower cranes are impressive works of engineering. Their height can reach up to 75 metres and they can lift up to 20 tons.

How many of the statements below are correct about the tower crane?

- Pulley and lever systems are used in tower cranes.
- The weight lifting capacity at the far end of the tower crane is called the minimum weight capacity.
- The strongest point of the tower crane is the furthest point from the centre of gravity of the pulley system.
- The hydraulic system provides the power of the tower cranes and the electric motor provides the pressure.

- A) 1 B) 2 C) 3 D) 4



Car engines heat up very quickly, so engines have cooling systems. Cooling systems are based on heat transfer. The heat generated in the engine is transferred to the cooling systems by the transfer method.

Accordingly, which of the following statements about cooling systems in engines is false?

- A) Water-cooled systems transfer more heat energy than air-cooled systems.
- B) The amount of heat transferred by air and water at 60 °C from the engine is the same.
- C) Air heats up faster than water.
- D) In liquid-cooled engines, the use of antifreeze in addition to water increases efficiency.

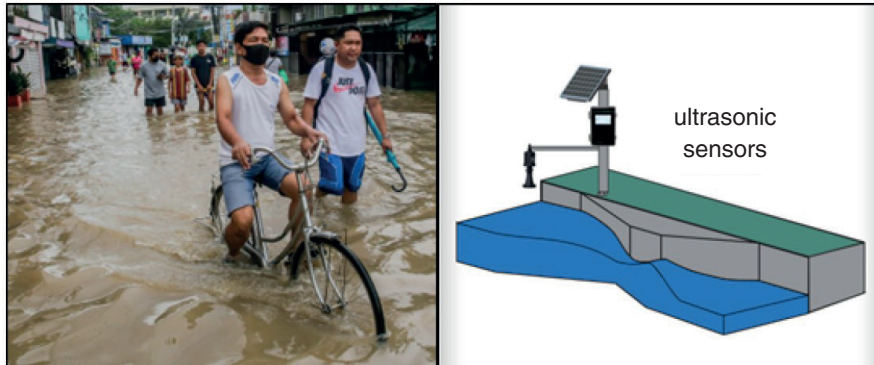


A space capsule is a simple-shaped spacecraft that can be used for reentry into the atmosphere without the use of wings or other features. As the space capsules return to Earth, their speeds reach 30,000 km/h, and their temperatures can reach over 1,500 degrees Celsius during their passage through the atmosphere. As a result, capsules require strong heat shields.

As the capsule passes through this low-density atmosphere layer and gets closer to the earth, the pressure created by the increasing thickness of the atmosphere slows it down and causes it to become colder. Then their parachutes open, and they land safely.

Which of the following statements about space capsules is not correct?

- A) The heat shields in space capsules are made of insulating ceramic material.
- B) The heat shields of the space capsules are made of a special material that burns easily. This is done to ensure that heat generated by friction is removed from the capsule.
- C) Parachutes used in space capsules reduce air resistance, allowing the capsule to land safely on the ground.
- D) Gravity and friction force act in opposite directions on a space capsule approaching towards the earth with a parachute.



Tropical rains, storm surges and tsunamis put the large number of islands in the Philippines at the forefront of the world's flood-prone islands. For this reason, all 258 rivers in the Philippines are monitored by water level measurement platforms. Ultrasonic sensors, which use sound waves to make contactless level measurements, play an important role in monitoring the risks that may cause floods. Flood warnings can be issued to at-risk communities in the Philippines at least six hours in advance, thanks to the data from ultrasonic sensors.

Which of the following information about ultrasonic sensors is/are correct?

- I. Distance measurements can also be made in space using ultrasonic sensors.
- II. The transmission speed of sound in the air is used by ultrasonic sensors to measure river water levels.
- III. Since the transmission speed of sound in air and water is the same, the same ultrasonic sensor can be used in both environments.
- IV. The working principle of ultrasonic sensors is based on the reflection (echo) of sound.

- A) II and IV
- B) I and III
- C) I, II and III
- D) I, II and IV



Micheal Gratzel developed solar panels that will enable electricity to be obtained from windows in homes and workplaces. This project brought him the Millennium Technology Award. Paint-sensitive solar panels, also known as Gratzel cells, are based on the principle of stimulating the dye between two glasses by light rays. This design is very similar to photosynthesis in living things. These panels are both transparent and cheaper than other Solar panels.

How many of the following statements about the energy producing windows designed by Michael Gratzel are correct?

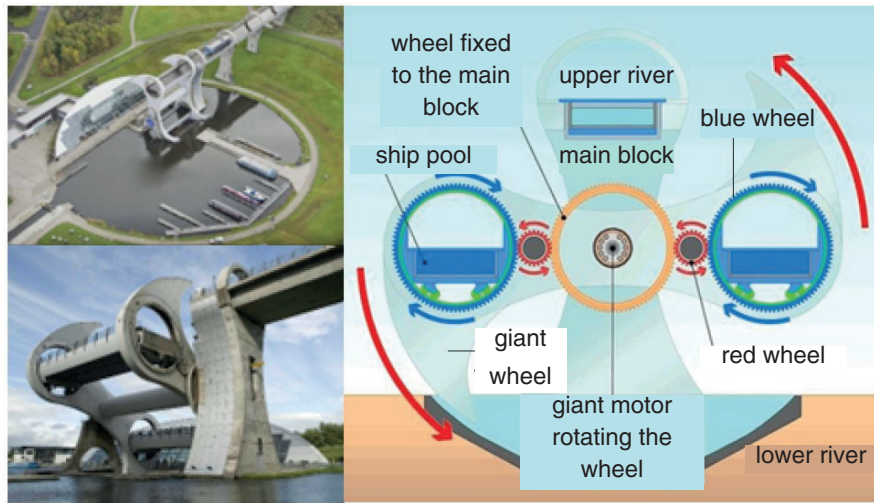
- I. The designed windows are an excellent example of producing clean, renewable energy.
- II. The reflection and refraction properties of light are used when obtaining electrical energy from windows.
- III. Gratzel cells were created by researching the physiology and structure of plant leaves.
- IV. Objects with colour and translucency absorb light more than those without colour and transparency.

A) 4

B) 3

C) 2

D) 1



The structure with the complex mechanism you see in the picture is actually just an elevator, but as it can be understood, it is not a simple elevator. This elevator is the only rotating ship elevator in the world that carries ships with many passengers inside.

The two ship pools in the elevator must rotate with the wheel in order to stay flat. The mechanism, which consists of three large gears of the same size, connected by two small gears in the elevator, ensures that the pools rotate at exactly the right speed and remain correctly balanced.

Accordingly, which of the following information about the Falkirk Wheel's working method is not correct?

- A) Red and blue gear wheels move in opposite directions.
- B) Red wheels spin faster while blue gear wheels spin slower.
- C) During the descent of a ship in the upper river channel to the lower river, the blue wheels make one full turn.
- D) Red wheels change the direction and speed of movement.