



Section One Practice Questions

Reasoning & Problem Solving

Questions 1–3:

Earth's climate is influenced by long-term changes in its movement through space. Both the shape of Earth's orbit around the Sun and the angle at which Earth is tilted change gradually over time. These changes are caused largely by gravitational interactions within the solar system. Jupiter and Saturn are particularly important in influencing the shape of Earth's orbit.

Earth rotates around an axis that is tilted rather than perfectly upright. The angle of this tilt, known as the axial tilt, changes over time between approximately 22.1° and 24.5° . The complete cycle from 22.1° to 24.5° and back again takes approximately 41,000 years.

A greater axial tilt produces more pronounced seasonal differences. In summer, the relevant hemisphere is tilted more towards the Sun, while in winter it is tilted further away. However, the effect is not the same everywhere on Earth. Increasing axial tilt generally produces a greater change in solar exposure at higher latitudes, while the effect near the equator is smaller.

When axial tilt decreases, seasonal differences become less pronounced. Reduced solar exposure at high latitudes can also contribute to long-term cooling. If less snow and ice melt during summer, snow and ice can accumulate over successive years, potentially contributing to the development of a glacial period.

Question 1

Earth's axial tilt is currently decreasing towards 22.1° . At the same time, average global temperatures are rising and severe weather events have become more frequent over the past 50 years. Which statement is most consistent with the information in the passage?

- A: Axial tilt is the cause of the current changes in climate.
- B: Climate change is influenced by multiple factors.
- C: The decreasing axial tilt will probably reduce the extent of current climate change.
- D: Human activity is the cause of the current changes in climate.

Question 2

A country located on the equator experiences an increase in Earth's axial tilt. Based on the passage, which outcome would be expected?

- A: Greater exposure to the Sun's rays.
- B: Less severe weather.
- C: Colder summers.
- D: Warmer summers.

Question 3

Earth last reached its maximum axial tilt of 24.5° in approximately 8700 BC. Assuming the pattern described in the passage continues and there are no major changes in climate behaviour, which outcome is most likely?

A: A new ice age may begin around 12,000 AD.

B: Severe weather may reach its maximum frequency in approximately 10,000 years.

C: Earth's orbit will be at its most elliptical in approximately 20,000 years.

D: Mild winters and cool summers will dominate around 22,000 AD.

Questions 4–5:

Six friends are comparing their heights. The following information is known:

- Brian is taller than Sarah.
- Lucy is taller than Conor but shorter than Alan.
- Carol is taller than Brian.
- Sarah is shorter than Alan.

Question 4

Which of the following statements must be true based on the information given?

A: Carol is taller than Sarah.

B: Brian and Sarah are the same height.

C: Alan is the tallest of the six friends.

D: More than half of the friends are taller than Sarah.

Question 5

Which additional piece of information would be sufficient to identify either the tallest or the shortest friend?

A: Lucy is not shorter than Sarah.

B: Alan is not taller than Brian.

C: Lucy is taller than Brian.

D: Lucy and Brian are the same height.

Questions 6–7:

Hugh is considering four cars at a local garage: a Ford, a Honda, an Audi and a BMW. The following information is available:

- The Audi is electric; the other three cars use either petrol or diesel.
- The Ford is blue.
- The BMW and the Honda have air conditioning.
- The red car does not have a reversing camera; all other cars do.
- The black car does not have a towbar; all other cars do.
- No two cars are the same colour.
- The fourth car is yellow.

Question 6

Conor considers air conditioning, a reversing camera and a towbar to be equally valuable. He is risk-averse and would prefer to be certain of having at least two of these features rather than risk having only one or none. Based only on the information provided, which car should he choose to minimise his risk?

A: The Ford.

B: The Honda or the BMW.

C: The Audi.

D: It makes no difference which car he chooses.

Question 7

Before looking at the cars, which single question would give Hugh enough information to determine which car he should buy?

A: Which make of car has no towbar?

B: What colour is the Audi?

C: Which car is red?

D: Which car is yellow?

Section One Solutions

1

Answer: C

A: As the axial tilt is reducing, the climate should be becoming more moderate, with warmer winters, cooler summers and less severe weather events. This is not happening.

B: While climate change is multifactorial, however this is not mentioned in the piece and is therefore incorrect.

C: Correct – The current axial tilt cycle should lead to less severe weather events and milder weather.

D: Incorrect – There is no mention of human activity or other factors impacting climate change in the paragraph.

2

Answer: C

While increased tilt leads to overall hotter summers for the hemispheres, countries on the equator move further away from the Sun as the tilt increases. Therefore, their summers will be colder. They will have less exposure to the Sun's rays, resulting in cooler summers and cooler winters, as well as potentially more severe weather

3

Answer: A

The cycle from 21 to 24 degrees and back to 21 degrees takes 41,000 years. Therefore, going from 21 to 24 degrees takes 20,500 years.

The last extreme (24 degrees) was just over 10,000 years ago. Therefore, Earth is currently around the midpoint between 21 and 24 degrees.

In another 10,000 years, the tilt will be at its minimum (12,000 AD). This could precipitate an ice age, as outlined above. There will be moderate weather, with cool summers, warm winters and less severe weather.

There is no mention of a relationship between tilt and orbital patterns. Likewise, there is no timeline given for orbital patterns. In 22,000 years, Earth will be midway between 21 and 24 degrees.

4

Answer: D

Ca > B > S

A > S

A > L > C

Ca, B and A are all taller than S.

L and C could be taller, shorter or the same height as S. In any case, at least 3 out of Sarah's 5 friends are taller than her.

5

Answer: B

If Alex is not taller than Brian, then he is shorter than Carol. Therefore, Carol has to be the tallest.

6

Answer: B

Both the Honda and the BMW have AC. If he chooses one of these, it must be red, black or yellow.

If it is red or black, he will get either a reversing camera or a towbar. If it is yellow, he will get both.

He is therefore guaranteed 2 features, with a chance of getting all 3. With the Audi, he can get a maximum of 2 features but risks getting only 1. With the Ford, he is guaranteed exactly 2 features.

7

Answer: D

The yellow car will have a reversing camera and a towbar. If it is the Honda or the BMW, then it will have all 3 features. If it is the Audi, then all 4 cars will have 2 features, so there is no difference between them.



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