

SCO INTERNATIONAL SCIENCE OLYMPIAD

Class 5 | 2025-26 | Ready Reviewed Edition

Designed for schools, teachers, parents, and students

Human Body	Plants & Food	Water & Atmosphere
Space Science	Environment	Scientific Reasoning

This paper develops concept clarity, real-life science reasoning, problem solving, environmental awareness, and applied scientific thinking for primary-level learners globally.

SCO INTERNATIONAL OLYMPIAD • OFFICIAL REVIEWED STUDY PAPER

Learning Focus: This paper helps young learners identify simple problems, choose useful ideas, understand fair prices, use money wisely, and practise honesty in small business situations.

Guidelines for the Candidate

- Total Questions: 50 | Time: 1 hour.
- There is only one correct answer for each question. Select one option only.
- All questions should be attempted. Calculator use is not required.
- Read each question carefully before choosing the answer.
- For paper-based practice, mark the selected option clearly on the answer sheet or notebook.
- This reviewed edition includes answer keys and explanations for learning and website publication.

Paper Segments

Segment	Question Range	Focus Area	Learning Purpose
A	Q1–Q21	General Science	Core facts and concept clarity
B	Q22–Q30	Applied Science Reasoning	Use concepts in practical and space/environment contexts
C	Q31–Q40	Case Study & Integrated Science	Analyse real-life situations and choose the best solution
D	Q41–Q50	Reason and Assertion	Evaluate scientific claims and explanations

Section A • General Science

Q1. Section A • General Science

Which organ is responsible for pumping blood throughout the body?

- A. Lungs
- B. Brain
- C. Heart
- D. Liver

Answer: C. Heart

Explanation: The heart pumps blood around the body. Blood carries oxygen and nutrients to different parts of the body.

Q2. Section A • General Science

Which cells in our blood help fight infections?

- A. Red blood cells
- B. Platelets
- C. White blood cells
- D. Plasma

Answer: C. White blood cells

Explanation: White blood cells help the body fight germs and infections. Red blood cells mainly carry oxygen, and platelets help blood clot.

Q3. Section A • General Science

A potato is actually a swollen part of which plant organ?

- A. Root
- B. Stem
- C. Leaf
- D. Flower

Answer: B. Stem

Explanation: A potato is a modified underground stem called a tuber. It stores food, mainly starch, for the plant.

Q4. Section A • General Science

A tsunami, or giant sea wave, is most often triggered by which event?

- A. Undersea earthquake
- B. Volcanic eruption on land
- C. Heavy rainfall
- D. Strong hurricane wind

Answer: A. Undersea earthquake

Explanation: Most tsunamis are caused by large and sudden movements of the ocean floor, usually due to undersea earthquakes.

Q5. Section A • General Science

Protein digestion begins in the stomach because the stomach secretes:

- A. Saliva
- B. Hydrochloric acid and pepsin
- C. Bile
- D. Amylase

Answer: B. Hydrochloric acid and pepsin

Explanation: The stomach releases hydrochloric acid and pepsin. Pepsin helps begin the digestion of proteins into smaller parts.

Q6. Section A • General Science

Which method preserves food by reducing available water and creating conditions that slow microbial growth?

- A. Freezing
- B. Salting or curing
- C. Roasting
- D. Boiling for one minute

Answer: B. Salting or curing

Explanation: Salting draws water out of food and microorganisms. With less available water, many spoilage microbes cannot grow easily.

Q7. Section A • General Science

In the water cycle, water vapour cools and changes back into tiny droplets to form clouds. What is this process called?

- A. Evaporation
- B. Condensation
- C. Precipitation
- D. Transpiration

Answer: B. Condensation

Explanation: Condensation is the process in which water vapour cools and changes into liquid water droplets. These droplets can form clouds.

Q8. Section A • General Science

Which gas in air is essential for burning or combustion?

- A. Nitrogen
- B. Oxygen
- C. Carbon dioxide
- D. Argon

Answer: B. Oxygen

Explanation: Oxygen supports burning. Without enough oxygen, most fuels cannot continue to burn.

Q9. Section A • General Science

Which planet is famous for its prominent ring system?

- A. Mars
- B. Jupiter
- C. Saturn
- D. Neptune

Answer: C. Saturn

Explanation: Saturn is best known for its large and bright rings. The rings are made mostly of ice and rock particles.

Q10. Section A • General Science

Which planet in the Solar System is the hottest, even though it is not the closest planet to the Sun?

- A. Mercury
- B. Venus
- C. Earth
- D. Mars

Answer: B. Venus

Explanation: Venus is the hottest planet because its thick carbon dioxide atmosphere traps heat through a strong greenhouse effect.

Q11. Section A • General Science

Which organ stores bile that helps digest fats?

- A. Liver
- B. Pancreas
- C. Gallbladder
- D. Stomach

Answer: C. Gallbladder

Explanation: The liver makes bile, but the gallbladder stores it. Bile helps break fat into smaller droplets in the small intestine.

Q12. Section A • General Science

Mustard seeds yield an edible oil rich in which type of nutrient?

- A. Carbohydrates
- B. Proteins
- C. Fats
- D. Vitamins

Answer: C. Fats

Explanation: Mustard oil is mainly made of fats. Fats give energy and help the body absorb certain vitamins.

Q13. Section A • General Science

Which layer of Earth's atmosphere contains the ozone layer that absorbs much of the Sun's harmful ultraviolet radiation?

- A. Troposphere
- B. Stratosphere
- C. Mesosphere
- D. Thermosphere

Answer: B. Stratosphere

Explanation: The ozone layer is found mainly in the stratosphere. It protects living things by absorbing much of the harmful UV radiation from the Sun.

Q14. Section A • General Science

In which part of the digestive system are fats mainly broken down and absorbed?

- A. Mouth
- B. Stomach
- C. Small intestine
- D. Large intestine

Answer: C. Small intestine

Explanation: Most fat digestion and absorption happen in the small intestine. Bile helps emulsify fats, and enzymes break them down further.

Q15. Section A • General Science

Which method slows bacterial growth by keeping food cold but not frozen?

- A. Canning
- B. Drying
- C. Refrigeration
- D. Smoking

Answer: C. Refrigeration

Explanation: Refrigeration slows the growth of many bacteria by keeping food at a low temperature. It does not usually freeze the food.

Q16. Section A • General Science

Pure distilled water has a pH of approximately:

- A. 3, acidic
- B. 7, neutral
- C. 9, basic
- D. 14, very basic

Answer: B. 7, neutral

Explanation: A pH of 7 is neutral. Pure water is considered neutral because it is neither acidic nor basic.

Q17. Section A • General Science

Which airborne pollutant can combine with rainwater to form acid rain that harms plants and buildings?

- A. Carbon monoxide
- B. Ozone
- C. Sulfur dioxide
- D. Methane

Answer: C. Sulfur dioxide

Explanation: Sulfur dioxide can react with water in the atmosphere to form acids. These acids can fall as acid rain.

Q18. Section A • General Science

Which planet's day, or rotation period, is longer than its year, or orbit period?

- A. Mercury
- B. Venus
- C. Mars
- D. Jupiter

Answer: B. Venus

Explanation: Venus rotates very slowly. One rotation on Venus takes longer than one orbit around the Sun.

Q19. Section A • General Science

Which bone protects the brain from injury?

- A. Femur
- B. Rib
- C. Skull
- D. Spine

Answer: C. Skull

Explanation: The skull is a strong bony case around the brain. It protects the brain from many injuries.

Q20. Section A • General Science

The main asteroid belt lies between which two planets?

- A. Mercury and Venus
- B. Venus and Earth
- C. Mars and Jupiter
- D. Jupiter and Saturn

Answer: C. Mars and Jupiter

Explanation: Most asteroids in the main asteroid belt orbit the Sun between Mars and Jupiter.

Q21. Section A • General Science

To make seawater safe for drinking by removing dissolved salt, which process uses evaporation followed by condensation?

- A. Filtration
- B. Distillation
- C. Sedimentation
- D. Boiling only

Answer: B. Distillation

Explanation: In distillation, water evaporates and leaves salt behind. The water vapour is then condensed back into fresh water.

Q22. Section B • Applied Science Reasoning

During a long-duration space mission, astronauts can lose muscle and bone strength because of microgravity. Which diet is most helpful for supporting bone mineralization and muscle strength?

- A. A diet rich only in carbohydrates and fibre
- B. A diet high in vitamin D, calcium, and protein
- C. A liquid diet high in fats and water only
- D. A diet mainly consisting of iron and vitamin C

Answer: B. A diet high in vitamin D, calcium, and protein

Explanation: Calcium and vitamin D support bones, while protein supports muscles. Astronauts need a balanced diet that helps reduce muscle and bone weakening.

Q23. Section B • Applied Science Reasoning

Scientists are designing a greenhouse on Mars using hydroponics. Mars has weak sunlight, very cold nights, and an atmosphere unlike Earth's. Which modification is most essential for continuous plant growth?

- A. Use plants that need no oxygen and grow in acidic soil only
- B. Use Martian soil alone as insulation
- C. Provide artificial light, temperature control, and regulated carbon dioxide
- D. Rely only on natural Martian sunlight and carbon dioxide

Answer: C. Provide artificial light, temperature control, and regulated carbon dioxide

Explanation: Plants need the right light, temperature, water, and gases. A controlled system with artificial light and regulated conditions would support growth better than relying on Mars's natural conditions.

Q24. Section B • Applied Science Reasoning

A remote area has little clean water, changing temperatures, and limited cooking fuel. Which food preservation method is most suitable for long storage with low resource use?

- A. Solar-powered dehydration followed by vacuum-packed storage
- B. Open storage in underground pits without packaging
- C. Fermentation for every type of food
- D. Refrigeration powered mainly by fossil-fuel generators

Answer: A. Solar-powered dehydration followed by vacuum-packed storage

Explanation: Removing moisture helps prevent microbial growth, and vacuum packing reduces air exposure. Using solar power makes the method more suitable where fuel and electricity are limited.

Q25. Section B • Applied Science Reasoning

A city has high levels of fine particles, nitrogen oxides, and sulfur dioxide from industries. Which factor most strongly contributes to long-term breathing problems?

- A. Long-term exposure to fine particles and nitrogen oxides that irritate and inflame the lungs
- B. Lack of oxygen due only to high humidity
- C. Excess carbon dioxide causing immediate suffocation in normal outdoor air
- D. High atmospheric pressure forcing pollutants deeper into the lungs

Answer: A. Long-term exposure to fine particles and nitrogen oxides that irritate and inflame the lungs

Explanation: Fine particles and gases such as nitrogen oxides and sulfur dioxide can irritate airways and damage lung health over time. These pollutants are major public health concerns.

Q26. Section B • Applied Science Reasoning

Astronauts on Europa, a moon of Jupiter, face intense radiation, very low temperatures, and no breathable air. Which technology set is most important for survival?

- A. A radiation-shielded habitat, oxygen supply, thermal control, and controlled food systems
- B. A suit with oxygen only and no radiation protection
- C. A habitat relying on naturally breathable oxygen from the ice
- D. A simple greenhouse on the surface with no shielding

Answer: A. A radiation-shielded habitat, oxygen supply, thermal control, and controlled food systems

Explanation: Europa is exposed to strong radiation from Jupiter's environment, and it has no breathable atmosphere for humans. A shielded, oxygen-supported, heated, controlled habitat would be essential.

Q27. Section B • Applied Science Reasoning

A disaster-prone village needs a low-energy food preservation system that keeps food safe and useful when electricity is unreliable. Which method is most effective?

- A. Combine sun-drying with low-energy solar dehydration to remove moisture quickly
- B. Use imported chemical preservatives only
- C. Use refrigeration with fossil-fuel generators only
- D. Use only advanced freeze-drying equipment that is difficult to maintain

Answer: A. Combine sun-drying with low-energy solar dehydration to remove moisture quickly

Explanation: This method combines local practice with renewable energy. Drying removes moisture, which slows spoilage, and solar dehydration can work even when grid electricity is unreliable.

Q28. Section B • Applied Science Reasoning

A team must recommend an energy strategy that protects the environment and public health. Which approach is most sustainable?

- A. Move strongly toward renewable energy with storage and efficiency improvements
- B. Keep relying mainly on fossil fuels and delay change
- C. Use only one energy source even if it creates other risks
- D. Depend only on unproven carbon-capture systems while continuing fossil fuel use

Answer: A. Move strongly toward renewable energy with storage and efficiency improvements

Explanation: Renewable energy sources can reduce air pollution and greenhouse gas emissions. Storage, efficiency, and planning help manage challenges such as intermittent supply.

Q29. Section B • Applied Science Reasoning

A scientist is planning food for astronauts on a long space mission. Which dietary plan is most balanced for health and digestion?

- A. Only easily digestible proteins and fibre with enzymes
- B. Mostly fats with little fibre
- C. Mostly carbohydrates with long fasting
- D. A balanced diet with proteins, carbohydrates, fats, micronutrients, and gut-health support

Answer: D. A balanced diet with proteins, carbohydrates, fats, micronutrients, and gut-health support

Explanation: A balanced diet gives the body many nutrients. Fibre, micronutrients, and gut-health support can help digestion during long missions.

Q30. Section B • Applied Science Reasoning

A colony on an extraterrestrial moon has limited sunlight, scarce water, and harsh environmental conditions. Which integrated farming approach best supports a stable food supply?

- A. Controlled-environment agriculture using LED lighting, hydroponics, sensors, and closed-loop water use
- B. Traditional soil farming only, using local regolith without control systems
- C. Greenhouse farming relying mainly on unpredictable external conditions
- D. Only one type of genetically modified crop with no other support system

Answer: A. Controlled-environment agriculture using LED lighting, hydroponics, sensors, and closed-loop water use

Explanation: Controlled systems can provide light, water, and environmental control even in harsh places. Hydroponics saves water, and sensors help maintain safe growth conditions.

Q31. Section C • Case Study & Integrated Science

A village has suffered a severe flood. Food supply is disrupted, water is unsafe, but nearby wild edible plants may be available. Which emergency plan best supports nutrition, safe digestion, and resilience?

- A. Teach safe identification and preparation of edible plants and use simple water purification such as boiling or solar disinfection
- B. Depend only on imported processed food and bottled water forever
- C. Use wild plants without safety checks and depend only on store chemicals
- D. Ignore local plants and wait for imported urban systems

Answer: A. Teach safe identification and preparation of edible plants and use simple water purification such as boiling or solar disinfection

Explanation: The best plan uses local resources safely and purifies water before drinking or cooking. This protects health and reduces dependence on outside supplies.

Q32. Section C • Case Study & Integrated Science

A city community garden wants to improve children's digestion by growing fibre-rich fruits and vegetables and teaching families how to cook them. Which approach is best?

- A. Use unfamiliar crops and advanced cooking methods that the community may reject
- B. Choose local, nutrient-rich plants and teach simple cooking methods that preserve fibre and nutrients
- C. Grow only high-calorie crops without fibre or micronutrients
- D. Import expensive superfoods that require special preparation

Answer: B. Choose local, nutrient-rich plants and teach simple cooking methods that preserve fibre and nutrients

Explanation: Local plants are easier to grow and accept. Fibre and vitamins support health, and simple cooking workshops make the project practical for families.

Q33. Section C • Case Study & Integrated Science

A smart kitchen uses AI to track nutrition needs, preserve food, and purify water. Which integrated strategy best supports health and digestion?

- A. Use AI to track nutrients, adjust preservation methods, and run solar-powered UV water purification
- B. Use AI only for recipes while storing food in open air
- C. Track only food spoilage and ignore water quality
- D. Use refrigeration and boiling only without monitoring nutrients or storage conditions

Answer: A. Use AI to track nutrients, adjust preservation methods, and run solar-powered UV water purification

Explanation: Food quality and water safety both affect health. A combined system can preserve nutrients, reduce spoilage, and provide cleaner water for digestion.

Q34. Section C • Case Study & Integrated Science

After a natural disaster, a rural community wants to combine AI monitoring with traditional preservation such as sun-drying and fermentation. Which plan is best?

- A. Use only AI and ignore traditional methods
- B. Combine AI sensors with community-led traditional methods to monitor quality and preserve local foods
- C. Use only traditional methods without checking changing conditions
- D. Use AI only for distribution and not for food quality

Answer: B. Combine AI sensors with community-led traditional methods to monitor quality and preserve local foods

Explanation: A hybrid plan uses the strengths of both approaches. AI can monitor spoilage risk, while traditional methods can continue even when high-tech systems face interruptions.

Q35. Section C • Case Study & Integrated Science

A future Mars colony uses AI for food preservation, water recycling, and atmosphere control. Which strategy best supports humans and plants?

- A. AI manages freeze-drying, vacuum sealing, water recycling with UV purification, and habitat air conditions
- B. Use natural plant growth with almost no control systems
- C. Use AI only for water and import all meals from Earth
- D. Use refrigeration only and manage water manually

Answer: A. AI manages freeze-drying, vacuum sealing, water recycling with UV purification, and habitat air conditions

Explanation: A Mars colony needs an integrated system. Safe food, recycled water, and suitable air conditions are all connected to human health and plant growth.

Q36. Section C • Case Study & Integrated Science

In a polluted city, an AI-powered wearable receives personal hydration and digestion data along with air and water quality data. Which use is most helpful?

- A. Track only steps and heart rate and give general tips
- B. Combine personal health indicators with live environmental data to give tailored diet and hydration advice
- C. Track only environmental data without personal guidance
- D. Use only old health records and ignore real-time pollution changes

Answer: B. Combine personal health indicators with live environmental data to give tailored diet and hydration advice

Explanation: Personal health and environmental conditions can both affect well-being. Combining them helps the device give more useful and timely advice.

Q37. Section C • Case Study & Integrated Science

During intense solar activity, power systems may fail and food storage may become unsafe. Which emergency technology best protects public health?

- A. An AI system that only sends alerts and waits for manual action
- B. An AI system that uses live data to switch preservation methods and adjust water purification during outages
- C. A fixed schedule that never changes with conditions
- D. AI only for water purification while food storage is fully manual

Answer: B. An AI system that uses live data to switch preservation methods and adjust water purification during outages

Explanation: Fast-changing emergencies need adaptive responses. AI can monitor conditions and adjust preservation and water purification quickly to reduce spoilage and health risks.

Q38. Section C • Case Study & Integrated Science

A hurricane damages farms and contaminates water. Authorities plan an AI-driven sustainable agriculture program with traditional preservation methods. Which strategy is best?

- A. Use only AI and ignore local knowledge
- B. Use AI for soil and irrigation, solar UV for water, and train farmers in fermentation and sun-drying
- C. Use only traditional methods and ignore water safety monitoring
- D. Import all seeds, water, and food without building local capacity

Answer: B. Use AI for soil and irrigation, solar UV for water, and train farmers in fermentation and sun-drying

Explanation: This approach gives both immediate support and long-term resilience. It combines technology, safe water, local farming, and traditional preservation.

Q39. Section C • Case Study & Integrated Science

A Mars-orbiting space station must support crew health, food quality, and resource management. Which approach is best?

- A. Import all meals and avoid fresh production
- B. Use only hydroponics without monitoring or preservation
- C. Combine AI health monitoring, hydroponic gardens, advanced preservation, and closed-loop water recycling
- D. Use manual health checks and simple storage only

Answer: C. Combine AI health monitoring, hydroponic gardens, advanced preservation, and closed-loop water recycling

Explanation: Long missions require many connected systems. Health monitoring, fresh produce, preserved food, and water recycling together support balanced nutrition and digestion.

Q40. Section C • Case Study & Integrated Science

A city wants to reduce food waste and support urban farms. Which AI-enabled waste-management system is most sustainable?

- A. Manual sorting only, with no nutrient control
- B. Incinerate food waste and ignore composting
- C. Use AI sorting, bioconversion into nutrient-rich compost, and sensors to control emissions
- D. Only predict future waste without recycling it

Answer: C. Use AI sorting, bioconversion into nutrient-rich compost, and sensors to control emissions

Explanation: Converting food waste into compost closes the nutrient cycle. AI can make sorting and composting more efficient and safer for the environment.

Section D • Reason and Assertion

Q41. Section D • Reason and Assertion

Assertion (A): Satellite-based remote sensing has improved water resource management by helping people monitor water bodies and plan agriculture more sustainably.

Reason (R): Satellites such as those used in Earth-observation programs provide regular data about water bodies, land cover, and environmental changes, helping detect droughts and floods earlier.

Which of the following is correct?

- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, but R is not the correct explanation of A.
- C. A is true, but R is false.
- D. A is false, but R is true.

Answer: A. Both A and R are true, and R is the correct explanation of A.

Explanation: Both statements are true. The reason explains how satellite data helps monitor water resources and supports better planning for farming and water use.

Q42. Section D • Reason and Assertion

Assertion (A): Combining AI with modern food preservation techniques can help retain food quality and support health.

Reason (R): AI systems can monitor storage conditions and adjust factors such as temperature, air exposure, and packaging conditions to slow nutrient loss and spoilage.

Which of the following is correct?

- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, but R is not the correct explanation of A.
- C. A is true, but R is false.
- D. A is false, but R is true.

Answer: A. Both A and R are true, and R is the correct explanation of A.

Explanation: The assertion is true, and the reason explains it. Monitoring and adjusting storage conditions helps keep food safer and more nutritious.

Q43. Section D • Reason and Assertion

Assertion (A): AI-enabled waste-to-compost systems can reduce food waste and support sustainable urban agriculture.

Reason (R): AI-optimized bioconversion can help produce compost with useful nutrients for growing plants.

Which of the following is correct?

- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, but R is not the correct explanation of A.
- C. A is true, but R is false.
- D. A is false, but R is true.

Answer: B. Both A and R are true, but R is not the correct explanation of A.

Explanation: Both statements are true. The reason explains how compost quality can help plants, but it does not fully explain all benefits, such as reducing waste and improving public health.

Q44. Section D • Reason and Assertion

Assertion (A): For a Mars colony, maintaining clean recycled water is more sustainable than relying only on water supplied from Earth.

Reason (R): Water quality does not affect plant growth or food preservation, so recycling systems have no direct role in food production.

Which of the following is correct?

- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, but R is not the correct explanation of A.
- C. A is true, but R is false.
- D. A is false, but R is true.

Answer: C. A is true, but R is false.

Explanation: The assertion is true because recycled clean water is essential for long-term survival. The reason is false because water quality affects both human use and plant growth.

Q45. Section D • Reason and Assertion

Assertion (A): Emerging wearable health-monitoring technologies can help people understand selected indicators related to hydration, metabolism, and nutrition.

Reason (R): Microfluidic and biosensor technologies can sample small amounts of body fluids such as sweat or interstitial fluid to measure selected biomarkers.

Which of the following is correct?

- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, but R is not the correct explanation of A.
- C. A is true, but R is false.
- D. A is false, but R is true.

Answer: A. Both A and R are true, and R is the correct explanation of A.

Explanation: Both statements are true in the context of emerging technology. The reason explains how small sensors can help collect useful health data.

Q46. Section D • Reason and Assertion

Assertion (A): Drought-resistant crops can help maintain food supply during periods of low rainfall.

Reason (R): Such crops are designed or selected to use water more efficiently and survive dry conditions better than ordinary varieties.

Which of the following is correct?

- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, but R is not the correct explanation of A.
- C. A is true, but R is false.
- D. A is false, but R is true.

Answer: A. Both A and R are true, and R is the correct explanation of A.

Explanation: The reason explains the assertion. Crops that can tolerate drought help farmers grow food when water is limited.

Q47. Section D • Reason and Assertion

Assertion (A): High-pressure processing can reduce food spoilage by inactivating many harmful microorganisms without using chemical preservatives.

Reason (R): High-pressure processing uses very high pressure to disrupt microbial cells while helping preserve food quality.

Which of the following is correct?

- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, but R is not the correct explanation of A.
- C. A is true, but R is false.
- D. A is false, but R is true.

Answer: A. Both A and R are true, and R is the correct explanation of A.

Explanation: Both statements are true. High-pressure processing is a non-thermal preservation method that can improve safety while maintaining food quality.

Q48. Section D • Reason and Assertion

Assertion (A): Research into photosynthesis and renewable-energy biology has supported the development of biofuels that can reduce carbon emissions.

Reason (R): Understanding how plants and algae convert sunlight and carbon dioxide into stored energy helps scientists improve biofuel-producing systems.

Which of the following is correct?

- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, but R is not the correct explanation of A.
- C. A is true, but R is false.
- D. A is false, but R is true.

Answer: A. Both A and R are true, and R is the correct explanation of A.

Explanation: The reason directly explains the assertion. Biofuels can be developed by studying biological energy conversion, especially in plants and algae.

Q49. Section D • Reason and Assertion

Assertion (A): Studies of day–night cycles, including the Martian sol of about 24.6 hours, can help scientists think about human sleep and body rhythms in space missions.

Reason (R): A Martian sol is only slightly longer than an Earth day, and this difference can influence schedules, sleep, and work planning for space crews.

Which of the following is correct?

- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, but R is not the correct explanation of A.
- C. A is true, but R is false.
- D. A is false, but R is true.

Answer: A. Both A and R are true, and R is the correct explanation of A.

Explanation: Both statements are true. The reason explains why studying Mars-like timing can be useful for understanding human circadian rhythms in space contexts.

Q50. Section D • Reason and Assertion

Assertion (A): Smart food packaging can help detect spoilage earlier and improve food safety.

Reason (R): Sensors in packaging can detect chemical markers produced during spoilage and may show a visible change, such as a colour change.

Which of the following is correct?

- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, but R is not the correct explanation of A.
- C. A is true, but R is false.
- D. A is false, but R is true.

Answer: A. Both A and R are true, and R is the correct explanation of A.

Explanation: The assertion and reason are true. The reason explains how smart packaging can warn people before spoiled food is eaten.

Consolidated Answer Key

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
C	C	B	A	B	B	B	B	C	B
Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20
C	C	B	C	C	B	C	B	C	C
Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
B	B	C	A	A	A	A	A	D	A
Q31	Q32	Q33	Q34	Q35	Q36	Q37	Q38	Q39	Q40
A	B	A	B	A	B	B	B	C	C
Q41	Q42	Q43	Q44	Q45	Q46	Q47	Q48	Q49	Q50

A	A	B	C	A	A	A	A	A	A
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