

**International Green Warrior Olympiad (IGWO)****Sample Paper****Pattern and Marking Scheme**

| Grade | Topic/Section | No. of Questions | Marks per Question | Total Marks |
|--------------------|----------------------|-------------------------|---------------------------|--------------------|
| Grade 9 | Green Champ | 40 | 3 | 120 |
| | Green Challenger | 10 | 6 | 60 |
| Grand Total | | 50 | | 180 |

The total duration of the exam is 60 minutes. There's a negative marking of $1/3^{\text{rd}}$ marks for every wrong answer.

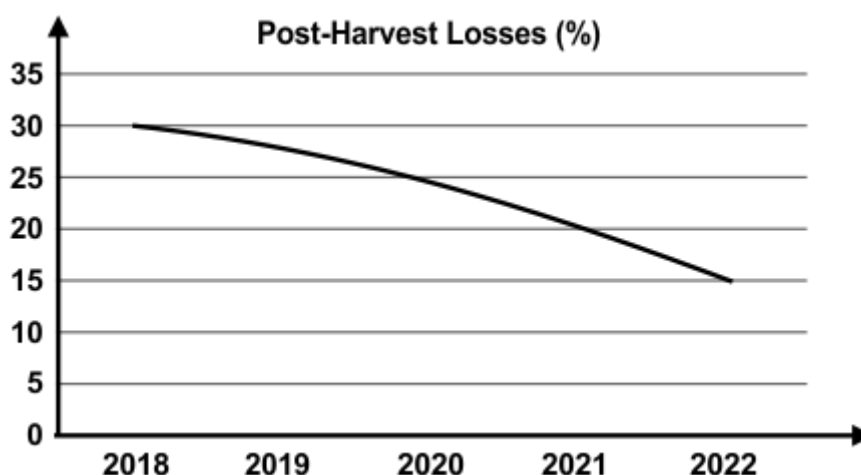
Syllabus

Clean Water and Sanitation, Affordable and Clean Energy, Sustainable Cities and Communities, Responsible Consumption and Production, Climate Action, Life Below Water, Life on Land, Zero Hunger

For more details, visit <https://www.crestolympiads.com/green-olympiad-gwo>.

Green Champ (Each Question is 3 Marks)

1. An individual is trying to reduce their carbon footprint through their diet. Which action would have the most significant impact on reducing carbon emissions?
 - a. Choosing locally sourced fruits and vegetables over imported ones.
 - b. Consuming organic meats instead of conventionally raised meats.
 - c. Opting for packaged vegetarian convenience foods.
 - d. Eating seafood exclusively sourced from sustainable fisheries.
2. The graph below demonstrates a 50% reduction in post-harvest food losses achieved by a cooperative of farmers through enhanced packaging and transportation practices. What specific strategies in packaging and transportation could account for this significant success?



- a. Using biodegradable packaging materials and increasing the number of intermediaries in the supply chain.
 - b. Utilising airtight packaging to preserve freshness and optimising transportation routes to minimise travel time and handling.
 - c. Employing large packaging to fit more produce and reduce the number of trips.
 - d. Using basic packaging materials and increasing the frequency of deliveries to retailers.
3. You are considering upgrading your smartphone to the latest model. What factors should you consider to minimise the environmental impact of your decision?
 1. The energy efficiency of the new model
 2. The durability and longevity of the new model
 3. The availability of recycling options for your old phone
 - a. Only 1
 - b. Only 1 and 2
 - c. Only 2 and 3
 - d. 1, 2, and 3
 4. A family is considering purchasing a new microwave to replace their old one, aiming to reduce their energy consumption and contribute to sustainability. They are researching various models to ensure they choose an energy-efficient appliance. In their evaluation of different microwave models for energy efficiency and sustainability, which factor would NOT typically be considered?
 - a. The appliance's power rating
 - b. The appliance's manufacturer
 - c. The appliance's energy consumption
 - d. The appliance's operating time

5. Consider two restaurants: one follows a "zero food waste" policy, while the other does not. Which environmental impact is most likely to be affected by the "zero food waste" policy?
- a. Land degradation
 - b. Air pollution
 - c. Biodiversity loss
 - d. Greenhouse gas emissions

6. Consider the case study given below and answer the following question:

Title: Forests as Crucial Carbon Capture Systems

Forests play a critical role in mitigating climate change by capturing and storing carbon dioxide from the atmosphere. Trees absorb carbon dioxide through photosynthesis and use it to grow. The carbon is then stored in the tree's biomass (wood, leaves, branches, and roots) and soil. Forests also help to regulate the climate by releasing water vapour into the atmosphere, which can form clouds and reflect sunlight back into space.

Trees are the most significant carbon sink in forests, storing carbon in their biomass. The amount of carbon stored in a tree depends on its species, size, and age. Young forests capture carbon rapidly due to the quick growth of trees. Middle-aged forests store relatively greater amounts of carbon as trees grow slower but sequester more carbon. Old-growth forests contain large trees that retain carbon for extended periods, albeit at a slower rate due to fewer trees overall.

Forest soils contain diverse forms of carbon influenced by soil type, vegetation, and geography. Soil properties, such as high organic content or frozen conditions, significantly impact carbon storage potential.

The carbon captured by forests is eventually returned to the atmosphere through processes like decomposition and respiration. Different forest types exhibit varying rates of carbon capture and release. Tropical forests capture carbon rapidly but can release it quickly too. In contrast, temperate forests offer a balanced solution.

Effective management strategies, such as forest preservation, sustainable forestry practices, forest expansion, and invasive species control, are crucial in optimising carbon sequestration potential while maintaining ecosystem balance.

Imagine conducting an experiment measuring carbon sequestration rates in four different forest types over the span of a year. Based on your understanding of the case study, which forest type would you expect to demonstrate the highest rate of carbon capture per unit area within a year?

- a. Young temperate forest
 - b. Old-growth tropical forest
 - c. Middle-aged temperate forest
 - d. Young tropical forest
7. As an environmental scientist conducting water quality assessments for a local lake used for swimming and boating, you're tasked with monitoring various parameters to ensure the safety and health of individuals engaging in recreational activities.

In this scenario, which of the following parameters would be of concern?

- 1. Turbidity
- 2. pH
- 3. Faecal coliform bacteria

- a. Only 1
- b. Only 1 and 2
- c. Only 2 and 3
- d. 1, 2, and 3

8. You are troubleshooting a high electricity bill and notice that even when all appliances are turned off, the energy meter is still registering a small amount of power usage. This phenomenon is known as a vampire load.
What is the main reason why vampire loads occur in most appliances?
- Appliances are not properly grounded, which causes them to leak electricity.
 - Appliances continue to draw a small amount of power even when they are turned off.
 - Appliances are designed to be constantly turned on, so they use more energy when they are off.
 - Appliances are not properly connected to power outlets, which causes them to malfunction.
9. A group of students, with a keen interest in studying a wide array of plant and animal species in their natural habitat, is planning an educational expedition. They aim to explore a biome that offers the highest biodiversity for their research.
Which biome among the following options would provide the most diverse range of plant and animal species for the students to observe?
- Tundra
 - Boreal forest
 - Tropical rainforest
 - Temperate forest
10. A city is expanding its wastewater treatment infrastructure to improve the quality of treated water released into the environment. As part of this development, engineers and environmental experts are reviewing the different stages of wastewater treatment to ensure the most effective processing of sewage.
In the wastewater treatment process, which stage involves the breakdown of organic matter by microorganisms in the absence of oxygen?
- Primary treatment
 - Tertiary treatment
 - Secondary treatment
 - Anaerobic digestion
11. Blair, an environmentally conscious consumer, is shopping for groceries at a local store. She notices a food product with an eco-label that states "Organic" on the packaging. Curious about its meaning, she checks the information available to understand the significance of the label.
In the context of eco-labelling, what does the presence of an "Organic" label on a food product signify based on Emily's observation?
- The product is made using recycled materials.
 - It is manufactured using renewable energy sources.
 - It's produced using sustainable farming methods without synthetic pesticides or fertilisers.
 - It contains natural ingredients.
12. Consider the following statements and choose the accurate one:
- Statement 1: Climate change impacts are solely limited to present environmental modifications.
- Statement 2: Climate change poses significant threats, including flooding, extreme heat, economic loss, and increased vulnerability, particularly for disadvantaged communities with limited resources.
- Statement 1 is correct but statement 2 is incorrect.
 - Statement 1 is incorrect but statement 2 is correct.
 - Both the statements are correct.
 - Both the statements are incorrect.

13. In your environmental science class, you're learning about the impact of different greenhouse gases on global warming. Your teacher has provided data showing an increase in two greenhouse gas concentrations since pre-industrial times: methane (CH₄) and nitrous oxide (N₂O).

If both gases have seen a 20% rise in concentration since pre-industrial times, which of the following statements is accurate based on their effect on raising global temperatures?

- a. Nitrous oxide would have a lower warming effect due to its longer atmospheric lifetime.
 - b. Methane would cause more significant warming due to its higher global warming potential.
 - c. Both gases would have equal impacts on global temperatures.
 - d. Methane currently has a larger impact due to its higher concentration, but nitrous oxide's long lifespan makes it a long-term concern.
14. Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. Which of the following is NOT a primary goal of ecological restoration?
- a. Reestablishing native plant and animal species to their original habitats
 - b. Restoring natural ecological processes and functions within the ecosystem
 - c. Promoting the sustainable use of resources and reducing human impacts on the ecosystem
 - d. Enhancing the economic value and productivity of the restored land
15. A farmer uses a private well to irrigate his crops. He notices that the well water has become increasingly salty over the past few years, affecting the growth and yield of his crops. What could be the most likely reason for this increase in salinity?
- a. Overextraction of groundwater from nearby wells
 - b. Intrusion of seawater into the freshwater aquifer
 - c. Application of fertilisers and pesticides on the farmland
 - d. Changes in rainfall patterns and natural recharge rates
16. A group of scientists studying the melting glaciers in Antarctica discovered ancient air bubbles trapped within the ice. Analysing these bubbles, they find significantly lower concentrations of carbon dioxide compared to the present atmosphere. This information suggests that:
- a. The current levels of carbon dioxide are within the natural range of variation for Earth's climate.
 - b. Human activities have significantly increased the concentration of carbon dioxide in the atmosphere.
 - c. The melting glaciers are a major source of carbon dioxide emissions contributing to global warming.
 - d. Ancient civilisations had developed advanced technologies to capture and store carbon dioxide.
17. Your city is considering expanding its aquaculture industry to meet the growing demand for seafood. However, traditional aquaculture practices can contribute to water pollution and habitat degradation. Which of the following approaches would be most sustainable for developing a responsible aquaculture industry?

- a. Increase the use of antibiotics and pesticides to control diseases in farmed fish.
 - b. Implement closed-loop systems that recycle water and waste within the aquaculture facility.
 - c. Source fish feed from wild-caught fish, which are readily available and inexpensive.
 - d. Locate aquaculture farms in open ocean environments to minimise their impact on coastal ecosystems.
- 18.** In a city prone to heatwaves, a group of students proposed a rooftop garden initiative to combat the urban heat island effect. How does the presence of rooftop gardens contribute to reducing the urban heat island effect?
- a. Rooftop gardens reduce surface temperatures by providing shade and evaporative cooling
 - b. Rooftop gardens release excess heat into the atmosphere
 - c. Rooftop gardens increase heat absorption from the sun
 - d. Rooftop gardens accelerate the formation of smog
- 19.** Dylan is considering buying a new smartphone. He knows that smartphones have a short lifespan and contribute to e-waste. He finds a company that offers a phone made with recycled materials and ethical sourcing practices. Compared to a conventional phone, how would this choice impact Dylan's environmental footprint?
- a. It would only slightly lessen his environmental impact, as smartphone production is inherently resource-intensive.
 - b. It would significantly reduce his e-waste generation and support ethical labour practices.
 - c. It would have a negligible effect, as the majority of the environmental impact comes from smartphone usage.
 - d. It would increase his footprint due to the higher production cost and potential for shorter lifespan.
- 20.** Maya, a young activist, is organising a campaign to reduce single-use plastics in her school. She argues that plastic production not only generates plastic waste but also contributes to climate change through:
1. Increasing deforestation for raw material extraction.
 2. Methane emissions from decomposing plastic in landfills.
 3. Increased reliance on fossil fuels for plastic manufacturing.
- a. Only 1
 - b. Only 1 and 2
 - c. Only 2 and 3
 - d. 1, 2, and 3
- 21.** A major Himalayan glacier, a vital source of freshwater for millions downstream, is retreating at an alarming rate. Satellite imagery reveals a significant decrease in the glacier's mass over the past few years. Data also shows a connection between rising global temperatures and the accelerated melting of glaciers worldwide. Considering the scenario, which of the following is the most likely consequence of the glacier's retreat for the communities downstream?
- a. Increased hydropower generation due to higher water flow
 - b. Improved water quality
 - c. Enhanced biodiversity in the surrounding ecosystem due to the release of nutrients
 - d. Water scarcity and competition for resources among communities

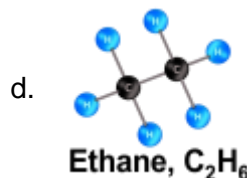
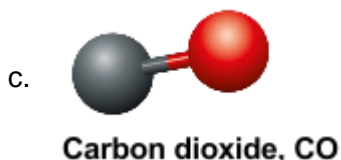
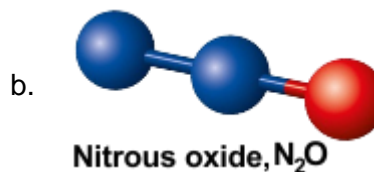
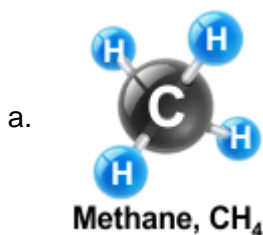
22. Jayden examined the consequences of illegal dumping of hazardous waste into oceans. Which chemical pollutant, commonly found in such waste, poses severe threats to marine life due to its bioaccumulation in the food chain?

- a. Oxygen
- b. Mercury
- c. Hydrogen
- d. Helium

23. A tropical country experiences frequent severe weather events, including but not limited to drought, hurricanes and cyclones, due to climate change. Its current reliance on large-scale hydropower plants makes it vulnerable to these extreme weather events. Which of the following clean energy sources is most likely to be resilient to these climate impacts?

- a. Large offshore wind farms located far from the coast
- b. Geothermal power plants situated deep underground
- c. Tidal and wave energy systems installed in coastal waters
- d. Rooftop solar panels on buildings and infrastructure

24. A city primarily using natural gas for domestic purposes experiences a sudden rise in respiratory ailments among its residents. Which gas, released during incomplete combustion of natural gas, is a major concern for human health?



25. A group of students studying ecology in a temperate forest notices a sharp decline in the local frog population. They discover that a new housing development has encroached upon a wetland area that was once home to a diverse array of amphibians. What is the likely consequence of the wetland habitat loss on the surrounding forest ecosystem?

- a. Disruption of food webs and energy flow, potentially impacting other animal populations.
- b. An imbalance in the nitrogen cycle as frogs play a vital role in decomposing organic matter.
- c. Enhanced soil fertility and plant growth due to nutrient-rich runoff from the development.
- d. Increased insect populations due to the absence of natural predators like frogs.

26. Consider the following statements and choose the correct option:

Statement 1: Deforestation leads to the loss of important carbon sinks, contributing significantly to global carbon emissions.

Statement 2: Forests serve as buffers against extreme weather events and help in regulating local and regional climates.

- a. Statement 1 is correct but statement 2 is incorrect.
- b. Statement 1 is incorrect but statement 2 is correct.
- c. Both statements are correct.
- d. Both statements are incorrect.

27. The adverse environmental effects of burning fossil fuels extend beyond local air pollution. Which of the following phenomena illustrates a global consequence of increased carbon emissions?

- a. Rise in sea levels due to ice cap melting
- b. Acid rain formation leading to soil degradation
- c. Groundwater contamination by oil spills
- d. Increased smog formation in urban areas

28. In a geologically active region, a community has installed a closed-loop geothermal energy system to harness the Earth's heat for heating purposes. The system has been operating efficiently, but during a particularly cold winter, the underground temperature experiences a significant decrease. What is the likely impact on the efficiency of the geothermal system?

- a. Efficiency increases due to better heat transfer in cooler conditions, providing more warmth.
- b. Efficiency decreases as the temperature drop reduces the available heat for the system.
- c. Efficiency remains unchanged despite temperature fluctuations, ensuring consistent heating.
- d. Efficiency doubles as the system compensates for lower temperatures, delivering enhanced performance.

29. Wanda notices that even when her electronic devices are turned off, they still consume a small amount of energy in standby mode. This "phantom power drain" adds up over time, contributing to wasted energy and higher electricity bills. What can Wanda do to reduce the phantom power drain in her home?

- 1. Unplug all her electronic devices when not in use.
- 2. Install smart power strips that automatically turn off unused devices.
- 3. Replace her old appliances with energy-efficient models.
- 4. Switch to a different electricity provider with lower rates.

- a. Only 1
- b. Only 1 and 2
- c. Only 2, 3 and 4
- d. 1, 2, 3 and 4

30. You're at the supermarket deciding between locally-grown organic vegetables and conventionally-grown vegetables shipped from a distant country. Both cost the same. Considering climate change:

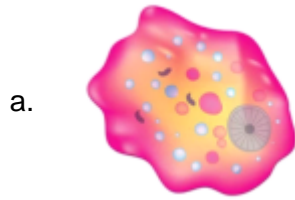
- a. The local organic option is always better due to reduced transportation emissions.
- b. Choose conventionally grown vegetables, as organic farming uses more water.
- c. Consider additional factors like packaging and water usage alongside transportation emissions.
- d. Both options have similar climate impacts, so focus on personal preference.

31. You and your friends enjoy a delicious pizza lunch, packed with toppings like pepperoni, cheese, and pineapple. Later, while scrolling through social media, you come across a post highlighting the environmental impact of meat production. This sparks a conversation about your food choices and how they might affect the planet. Considering the environmental footprints of your pizza toppings, which topping likely had the highest emissions associated with its production?

1. Pepperoni
2. Cheese
3. Pineapple

- a. Only 1
- b. Only 2
- c. Only 3
- d. 1, 2, and 3

32. A community experiences an outbreak of a waterborne disease called Amoebiasis, characterised by severe abdominal cramps, diarrhoea with blood, and high fever. Individuals affected report exposure to contaminated water sources. Identify the causative agent responsible for these symptoms.



Entamoeba histolytica



Giardia lamblia



Vibrio cholerae



Shigella dysenteriae

33. Which innovative water purification method uses a combination of biological processes involving microorganisms to break down organic matter and remove contaminants from wastewater?

- a. Coagulation
- b. Sedimentation
- c. Membrane bioreactors
- d. Flocculation

34. Consider the following statements and choose the correct option:

Statement 1: Groundwater is primarily recharged through precipitation that infiltrates into the soil.

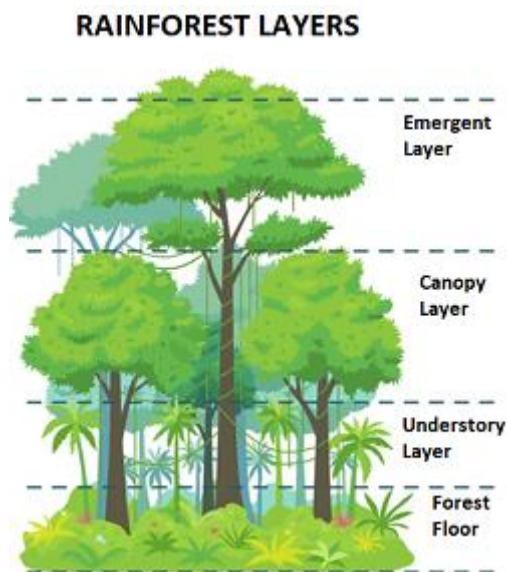
Statement 2: Groundwater, once depleted, can be quickly replenished through human interventions like pumping water from surface reservoirs.

- a. Statement 1 is correct but statement 2 is incorrect.
- b. Statement 1 is incorrect but statement 2 is correct.
- c. Both the statements are correct.
- d. Both the statements are incorrect.

35. A city council plans to implement a policy mandating the separation of organic waste (such as food scraps and yard waste) from other household garbage. Which environmental impact is most directly addressed by this policy?

- a. Minimising soil erosion in nearby agricultural lands
- b. Reducing methane emissions from landfills
- c. Curbing air pollution caused by burning waste
- d. Mitigating water contamination from landfill leachate

36. Satellites have documented the rapid retreat of glaciers in Antarctica and Greenland, contributing significantly to global sea level rise. In addition to coastal flooding, this melting ice could also:
- Lead to the discovery of new mineral resources beneath glaciers.
 - Disrupt ocean currents, impacting global weather patterns.
 - Decrease the salinity of seawater, harming marine life.
 - Create vast new fishing grounds as previously frozen areas become accessible.
37. In the dense, lush forests of the Amazon basin, researchers are studying the ecosystem's dynamics to understand its role in global environmental processes. Which specific layer of the forest ecosystem plays a crucial role in regulating carbon levels and atmospheric moisture?



- Emergent layer
- Canopy layer
- Understory layer
- Forest floor

Direction for (Question 38 to 40): Consider the case study given below and answer the following question:

Case Study: Protecting the Coral Reefs of Raja Ampat, Indonesia

Location: Raja Ampat, a stunning archipelago in Indonesia famed for its thriving coral reefs, biodiversity, and diving tourism.

Challenges:

Overfishing: Unsustainable fishing practices, including blast fishing and cyanide fishing, have depleted fish stocks and damaged coral reefs.

-Pollution: Plastic pollution, agricultural runoff, and sedimentation from coastal development all threaten the delicate marine ecosystem.

-Climate Change: Rising ocean temperatures and acidification are bleaching and killing coral, the foundation of the reef ecosystem.

Initiatives:

-Marine Protected Areas (MPAs): Establishing and enforcing MPAs restricts harmful fishing practices and allows reefs to recover. Raja Ampat boasts one of the largest MPAs in Southeast Asia, covering over 1.5 million hectares.

-Community-Based Management: Local communities play a crucial role in protecting their reefs. The Coral Triangle Initiative focuses on empowering them through sustainable fishing practices and alternative livelihoods like ecotourism.

-Sustainable Aquaculture: Farming fish responsibly reduces pressure on wild stocks and provides alternative income for fishermen. Locally managed fish farms in Raja Ampat demonstrate successful alternatives to overfishing.

-Coral Restoration: Innovative techniques like coral nurseries and transplantation help regenerate damaged reefs and restore marine biodiversity.

Outcomes:

-Fish stocks are rebounding: The Raja Ampat MPA has shown a significant increase in fish biomass within its boundaries, demonstrating the effectiveness of protected areas.

-Improved water quality: Reduced pollution and sedimentation contribute to healthier corals and a more vibrant marine environment.

-Empowered communities: Local involvement in conservation fosters environmental stewardship and provides sustainable economic opportunities.

Raja Ampat serves as a beacon of hope in marine conservation, demonstrating the effectiveness of community-driven, multi-pronged approaches to protecting life below water. By tackling overfishing, pollution, and climate change, we can safeguard the future of these vital ecosystems and the communities that depend on them.

38. A plastic net washes ashore on the Raja Ampat beach. Trace its potential journey through the marine ecosystem, describing the environmental and ecological consequences it could cause at each stage.

1. Entanglement for sea turtles, fish, and coral, leading to injuries and potential death.
2. Ingestion by marine life, mistaking it for food, causing blockages and internal damage.
3. Breakage into microplastics, accumulating in the food chain and harming higher predators.

- | | |
|-----------------|-----------------|
| a. Only 1 | b. Only 1 and 2 |
| c. Only 2 and 3 | d. 1, 2, and 3 |

39. A plastic net washes ashore on the Raja Ampat beach. Trace its potential journey through the marine ecosystem, describing the environmental and ecological consequences it could cause at each stage.

1. Pollution weakens coral reefs, making them more susceptible to bleaching and mortality as ocean temperatures rise.
2. Climate change alters ocean currents, causing an increased accumulation of pollutants near reefs, adding to their stress.
3. Pollution can harm reefs, but it doesn't significantly affect their vulnerability to climate change impacts.

- | | |
|-----------------|-----------------|
| a. Only 1 | b. Only 1 and 2 |
| c. Only 2 and 3 | d. 1, 2, and 3 |

40. What is a long-term challenge that the case study implies requires continuous global support to ensure the success of marine conservation in Raja Ampat?

- | | |
|--------------------------------|---|
| a. Local community empowerment | b. Improved water quality |
| c. Plastic pollution control | d. Mitigation of climate change impacts |

Green Challenger (Each Question is 6 Marks)

41. You are an environmental scientist analysing water quality parameters from two different sources, Source A and Source B. These sources provide water to nearby ecosystems. Consider the following data table showing water quality parameters from two different sources. Based on this data, which of the statements is most likely true?

1. Higher nutrient levels in Source A suggest an increased likelihood of eutrophication.
2. Source B has higher Dissolved Oxygen and Total Dissolved Solids (TDS) than Source A, implying better water quality for the nearby ecosystems.
3. Lower Dissolve Oxygen levels in Source A indicate the potential for oxygen depletion due to increased organic matter decomposition.
4. Hypoxic and alkaline conditions in Source B can lead to the formation of algal blooms.

| Parameter | Source A | Source B |
|------------------------------|----------|----------|
| pH | 6.8 | 8.2 |
| Dissolved Oxygen | 2.5 mg/L | 5.0 mg/L |
| Nitrate Levels | 2.0 mg/L | 0.5 mg/L |
| Total Dissolved Solids (TDS) | 300 ppm | 500 ppm |

- | | |
|---|---|
| <p>a. Only 1 and 2</p> <p>c. Only 2 and 3</p> | <p>b. Only 1 and 3</p> <p>d. Only 2 and 4</p> |
|---|---|

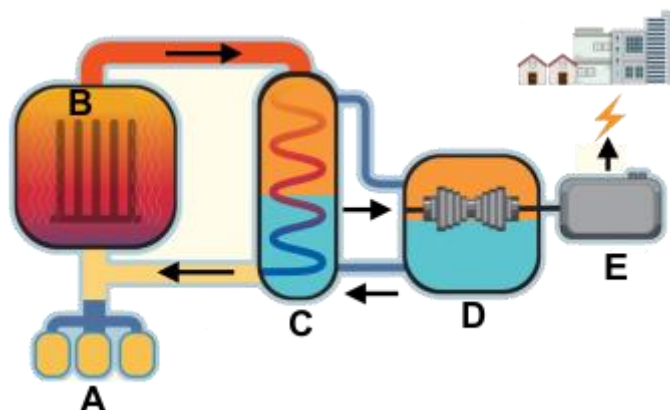
42. A local environmental agency is tasked with evaluating the water quality of a river that runs through a town. The river serves as a primary source of drinking water, recreational activities, and supports aquatic life. Concerns have been raised about the river's health due to changes in its appearance and reports of fish mortality.

Please select the most appropriate answer that reflects the main categories relevant to evaluating the river's water quality.

- a. Point source, non-point source, and groundwater
- b. Organic, inorganic and synthetic parameters
- c. Physical, chemical, and biological factors
- d. Natural, artificial and treated sources of water

43. You are a technician working at a nuclear power plant. You are tasked with performing routine inspections of the plant's various components. To ensure your understanding, your supervisor provides you with a diagram of the plant layout and asks you to identify the labelled components.

Based on the diagram below, identify the main components of a nuclear power plant.



- a. A: Steam generator
B: Coolant
C: Reactor core
D: Turbine
E: Electricity generator
- b. A: Reactor core
B: Coolant
C: Turbine
D: Electricity generator
E: Steam generator
- c. A: Coolant
B: Reactor core
C: Steam generator
D: Turbine
E: Electricity generator
- d. A: Steam generator
B: Reactor core
C: Coolant
D: Electricity generator
E: Turbine

44. A family living in a region with abundant clean hydropower is considering replacing their ageing gas oven with a new electric model. However, they are concerned about the overall environmental impact of each option. Analyse the following data table and choose the most likely outcome of switching to electric based on environmental considerations.

| Factor | Gas Oven | Electric Oven |
|------------------------------------|--------------------------|---------------------------|
| Fuel source | Natural gas | Hydropower |
| Greenhouse gas emissions (per kWh) | 0.4 kg CO ₂ e | 0.05 kg CO ₂ e |
| Energy efficiency | 70% | 85% |
| Manufacturing emissions | Low | Moderate |

- a. The outcome depends on the specific cooking habits and energy consumption of the family.
- b. Both options contribute similar amounts of greenhouse gasses and the choice is negligible in terms of environmental impact.
- c. The gas oven will likely have a lower overall ecological footprint due to lower manufacturing emissions and electric oven will have higher.
- d. The electric oven will definitely have a lower overall ecological footprint and the gas oven will have higher.
45. An evaluation was conducted on the environmental impact of four different gaming consoles used extensively by a group of gamers. The details about consoles are provided in the table below. Based on the information, which gaming console is likely to have caused the least environmental impact during the assessment period?

| Console Model | Manufacturer | Usage Intensity | Environmental Aspects |
|---------------|-------------------------|------------------------|---|
| Console P | Ecogaming Inc. | High intensity gaming | Made from recycled materials, energy-efficient mode |
| Console Q | FutureTech Co. | Moderate gaming usage | No eco-friendly features mentioned |
| Console R | Sustainable Gaming Ltd. | Low energy consumption | Recyclable components, energy-saving standby mode |
| Console S | Green Console Corp. | Heavy gaming usage | Energy Star certified, made from sustainable plastics |

- a. Console P
c. Console R
- b. Console Q
d. Console S

46. Consider the following statements and choose the correct option:

1. Debris accumulation in oceans primarily consists of organic waste, which enhances marine biodiversity by providing habitats for various species.
 2. Sustainable aquaculture involves utilising antibiotics to control diseases and enhance fish growth in farms.
 3. Coastal development and shoreline alterations significantly impact marine habitats or disrupt the natural flow of sediments in coastal areas.
 4. Overfishing contributes to the creation of dead zones due to the imbalance in marine ecosystems caused by the removal of certain fish species.
- a. Statements 1 and 2 are correct but statements 3 and 4 are incorrect.
 - b. Statements 1 and 2 are incorrect but statements 3 and 4 are correct.
 - c. Statements 2 and 4 are incorrect but statements 1 and 3 are correct.
 - d. Statements 1 and 3 are incorrect but statements 2 and 4 are correct.

47. During a science fair, a student presented a project on the impact of wildfires on climate change. They highlighted that wildfires release vast amounts of carbon dioxide, methane and nitrous oxide into the atmosphere as shown in the table given below.

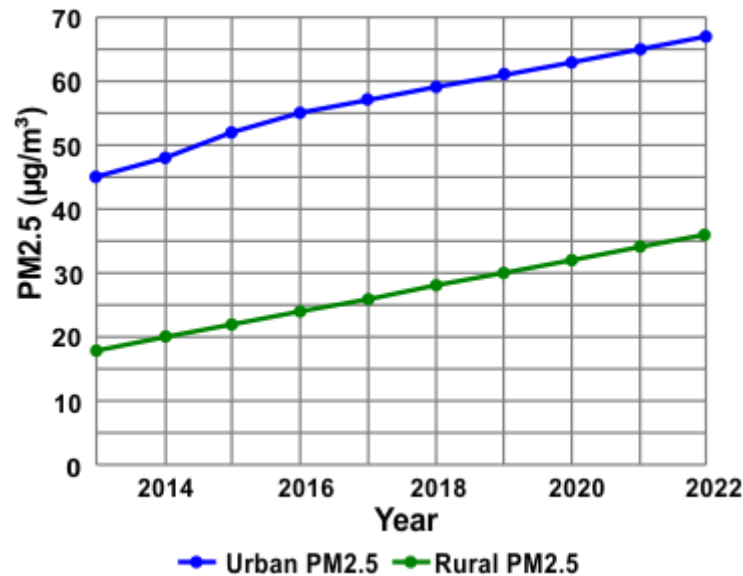
What inference can be made from this presentation?

1. Wildfires can act as a positive feedback loop, contributing to further warming and potentially more frequent fires.
2. Wildfires are primarily responsible for the rising levels of greenhouse gases in the atmosphere.
3. All wildfires should be suppressed to prevent any carbon dioxide, methane and nitrous oxide emissions.
4. The release of greenhouse gases from wildfires is balanced by the absorption of carbon dioxide by new plant growth.

| Greenhouse Gas | Amount Before Wildfire (tons) | Amount Released by Wildfire (tons) | Increase (%) |
|-----------------------------------|-------------------------------|------------------------------------|--------------|
| Carbon Dioxide (CO ₂) | 30,00,000 | 10,00,000 | 33.33% |
| Methane (CH ₄) | 1,00,000 | 50,000 | 50% |
| Nitrous Oxide (N ₂ O) | 10,000 | 5,000 | 50% |

- a. Only 1
- b. Only 2 and 3
- c. Only 1, 2 and 3
- d. 1, 2, 3 and 4

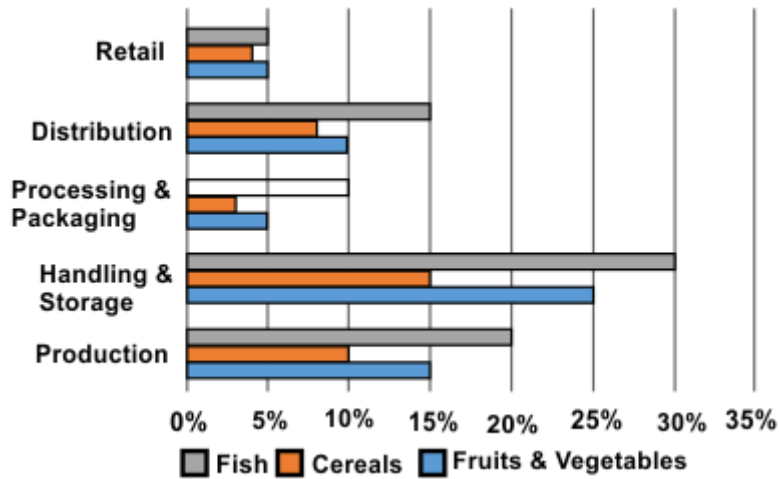
48. You live in a small town nestled near a bustling city. Your town council is considering a proposal to expand the city limits, potentially encroaching on your rural area. You're concerned about the potential impact on air quality and sustainability. The data regarding the levels of particulate matter over last few years was graphed. Based on the information provided in the graph below and your concerns about sustainability, which statement best reflects the potential consequences of urban expansion on your town and its surrounding environment?



- Urban expansion will likely lead to improved air quality in both the city and your town due to stricter regulations and technological advancements.
 - Urban expansion will likely lead to worsening air quality in both the city and your town due to increased industrial activity and traffic congestion.
 - Urban expansion will likely lead to improved air quality in the city but worsening air quality in your town due to prevailing winds carrying pollution from the city.
 - Urban expansion will likely have a minimal impact on air quality in both the city and your town, as air pollution levels are already high in both areas.
49. You're a wildlife conservationist working in the Himalayas, where a dwindling snow leopard population faces new challenges. Human encroachment has forced wolves into higher altitudes, overlapping with the leopards' territory, while climate change is shrinking their habitat due to melting glaciers. You propose a conservation plan to address these challenges. Which of the following options is/are the effective and sustainable long-term solution(s), considering ecological balance and ethical implications?
- Prioritise eliminating the wolf threat to restore the leopards' competitive advantage.
 - Lobby for stricter regulations on human activities near snow leopard habitat.
 - Invest in renewable energy sources to combat climate change.
 - Develop captive breeding programs to supplement dwindling wild populations.
- Only 1 and 4
 - Only 2 and 3
 - Only 1, 2 and 3
 - 1, 2, 3 and 4

50. Imagine you're a development consultant working with a government agency in a developing country concerned about the high levels of post-harvest food losses. You're tasked with recommending the most impactful intervention based on the data provided in the graph below.

Which intervention would likely yield the greatest reductions in overall food losses while maximising impact across multiple commodities?



- Investing in improved storage facilities at the farm level.
- Strengthening cold chain infrastructure across the supply chain.
- Training retailers on proper handling and display techniques.
- Promoting consumer awareness about food waste reduction.

Answer Key

| | | | | | | | | | | | | | |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1. | a | 2. | b | 3. | d | 4. | b | 5. | d | 6. | d | 7. | d |
| 8. | b | 9. | b | 10. | d | 11. | c | 12. | b | 13. | d | 14. | d |
| 15. | b | 16. | b | 17. | b | 18. | a | 19. | b | 20. | d | 21. | d |
| 22. | b | 23. | b | 24. | c | 25. | a | 26. | c | 27. | a | 28. | b |
| 29. | b | 30. | c | 31. | a | 32. | a | 33. | c | 34. | a | 35. | b |
| 36. | b | 37. | b | 38. | d | 39. | b | 40. | d | 41. | b | 42. | c |
| 43. | c | 44. | d | 45. | c | 46. | d | 47. | a | 48. | c | 49. | b |
| 50. | b | | | | | | | | | | | | |