

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

Grade	Topic/Section	No. of Questions	Marks per Question	Total Marks
Grade 7	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.

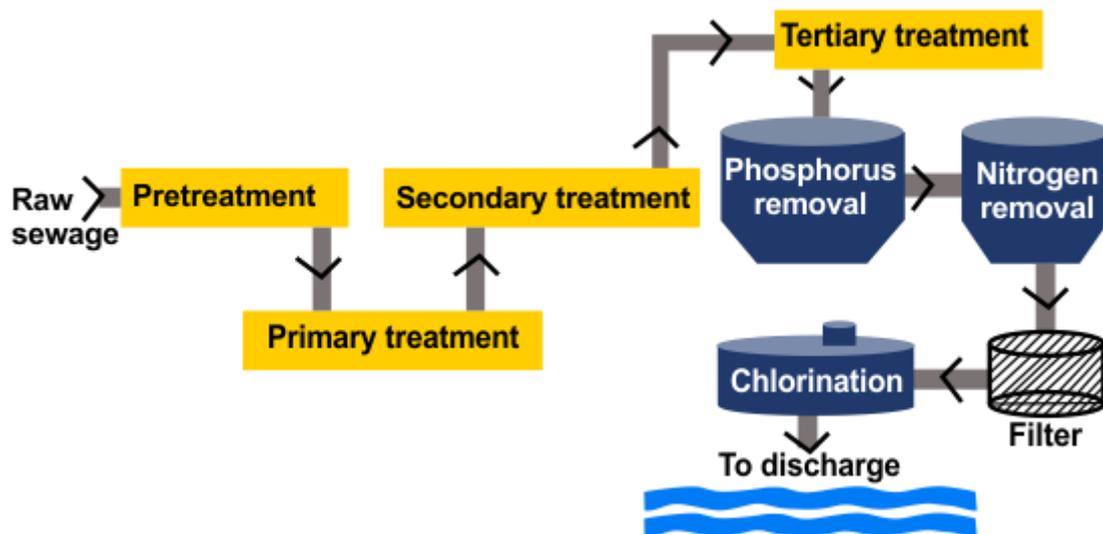
Syllabus

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)

- In a water quality testing experiment, you're examining a water sample. Upon adding a specific reagent to the sample, it turns blue. What does the colour change of the water sample indicate about its quality in this experiment?
 - Presence of CO_2
 - Neutral pH
 - High chlorine content
 - Presence of ammonia
- In a coastal city, citizens are concerned about the decreasing number of mangrove forests. What role do mangrove forests play in protecting marine ecosystems, and how can their depletion harm marine life?
 - Mangroves prevent erosion and provide habitats; their depletion can lead to loss of breeding grounds for fish and increased coastal erosion
 - Mangroves absorb excess nutrients; their depletion can lead to overgrowth of marine plants and decreased oxygen levels in water
 - Mangroves reduce ocean acidity; their depletion can lead to coral bleaching and loss of biodiversity
 - Mangroves filter pollutants; their depletion has no significant impact on marine life
- You are tasked with designing a wastewater treatment plant. Which stage of the treatment process is responsible for removing solid particles from sewage water?



- Primary treatment
 - Secondary treatment
 - Tertiary treatment
 - Chlorination
- A restaurant implements some new practices in their kitchen, such as using a dishwasher efficiently and fixing leaks promptly. What impact does this have on their overall sustainability?
 - It has no effect on sustainability.
 - It reduces water consumption and contributes positively to sustainability.
 - It increases water wastage and negatively affects sustainability.
 - It solely improves the restaurant's kitchen hygiene but doesn't impact sustainability.

5. A community in a rural area is facing water quality issues due to the presence of microbial contaminants in their water supply. Which of the following water treatment methods would be the most effective in removing microbial contaminants and ensuring safe drinking water for the entire community?

- a. Filtration
- b. Boiling
- c. Chlorination
- d. Distillation

6. In a biology class, students are discussing the various components of the water cycle. How does transpiration contribute to this natural process?



- a. It adds water vapour to the atmosphere from plant leaves.
 - b. It causes rainfall directly.
 - c. It prevents the water cycle from functioning.
 - d. It decreases the humidity in the atmosphere.
7. A town located near a geothermal hotspot is exploring various uses for geothermal energy. Considering the town's needs and available resources, where could geothermal energy be most efficiently utilised?
- a. Heating residential buildings in cold climates
 - b. Powering portable electronic devices
 - c. Fuelling vehicles for long-distance travel
 - d. Illuminating streetlights in urban areas
8. Considering the impact of climate change, which of the following species is likely to face the highest risk of endangerment?
- 1. A migratory bird species
 - 2. A deep-sea fish species
 - 3. A reptile species in a tropical forest
- a. Only 1
 - b. Only 1 and 2
 - c. Only 2 and 3
 - d. 1, 2, and 3
9. Imagine you're a product designer excited about creating a fantastic new line of toys for kids that are eco-friendly as well. Which of the following toys is most likely made from sustainable material?
- a. A toy robot made from conventional plastic derived from petroleum.
 - b. A puzzle made from wood from the forest
 - c. A toy car made from recycled plastic collected from beaches
 - d. A stuffed animal made from synthetic fibres and polyester materials.

- 10.** A local community is considering converting a large area of forest into farmland. What are some potential environmental consequences of this conversion?
1. Loss of habitat for many plant and animal species
 2. Increased soil erosion due to removal of vegetation
 3. Reduced air quality due to increased dust and pollution
- a. Only 1
b. Only 1 and 2
c. Only 2 and 3
d. 1, 2, and 3
- 11.** You aim to reduce your carbon footprint through dietary changes. Which dietary adjustment would have the most significant positive impact based on their respective average annual carbon footprint?
- a. Consuming more red meat
b. Eating locally sourced produce
c. Reducing food waste
d. Choosing plant-based proteins
- 12.** Lisa and Michael are environmental consultants advising a town's energy committee on renewable energy options. The committee is debating between hydroelectric, solar, and wind power for their region's future energy needs.
Why might hydroelectric power be considered more versatile than solar or wind power?
- a. Hydroelectric power generates electricity consistently, regardless of weather condition.
 - b. Hydroelectric power works in many different regions, unlike solar and wind limited by location.
 - c. Hydroelectric power requires larger land areas than solar or wind farms.
 - d. Solar and wind power have higher energy conversion efficiencies than hydroelectric power.
- 13.** Consider the following scenario and choose the correct option.
Scenario: You're a college student living in a shared hostel room with two other roommates. You've noticed increased common illnesses among your roommates, like colds, flu, and stomach upsets. You suspect poor hygiene might be playing a role.
- Instructions: Choose the MOST LIKELY way your hygiene habits could contribute to your roommates' health problems, and explain your reasoning.
- a. You always shower after gym class, but you only wash your hands before eating.
 - b. You keep your laundry hamper overflowing with dirty clothes for days before washing them.
 - c. You clean your desk surface regularly, but you rarely disinfect your phone or laptop keyboard.
 - d. You use a common towel to dry your hands after washing them in the shared bathroom.
- 14.** In a bustling city, Liam noticed a power plant emitting a dense cloud of smoke. He learned that the power plant burned coal, releasing sulphur dioxide and other pollutants.
- Which environmental issues are primarily associated with this scenario?
- a. Soil erosion and deforestation
b. Desertification and habitat loss
c. Air and water pollution
d. Noise pollution and thermal expansion
- 15.** Which practice aligns with the goal of "recycling" household waste?
- a. Throwing away mixed materials in one bin.
b. Composting organic waste separately.
c. Discarding electronics with regular trash.
d. Mixing paper and plastic in the recycling bin.

16. Sarah is discussing climate change in her geography class. She mentions that climate and weather are often confused but differ significantly. Which statement best defines climate compared to weather?
- Weather is short-term atmospheric conditions, while climate refers to long-term patterns.
 - Climate denotes daily atmospheric changes, while weather indicates seasonal trends.
 - Weather involves global changes, while climate focuses on regional variations.
 - Climate encompasses extreme events, while weather involves mild fluctuations.
17. An agricultural study highlighted the impact of changing climate on crop yields, showing a decline in productivity due to irregular rainfall patterns. What is the primary consequence of irregular rainfall patterns on agricultural productivity?
- Increased soil nutrient retention
 - Greater crop resilience to weather fluctuations
 - Reduced water stress on crops
 - Yield losses due to water scarcity and drought
18. Researchers observed a significant reduction in phytoplankton populations in a study area. What potential impact does this reduction have on the carbon cycle?
- Decrease in atmospheric CO₂ levels due to reduced photosynthesis.
 - Increase in CO₂ levels as phytoplankton absorb less carbon.
 - No effect on the carbon cycle as phytoplankton are not significant carbon absorbers.
 - Elevated carbon sequestration in oceans as phytoplankton decrease.
- Only 1
 - Only 3
 - Both 1 and 4
 - Both 3 and 4
19. Maria, a marine biologist, conducted a study in a coastal area. She noticed a decline in the population of a specific species of fish. Further research revealed that the rising ocean temperatures were affecting their breeding grounds. Which of the following best explains how increased ocean temperatures impact fish populations?
- Elevated temperatures facilitate better breeding conditions for fish.
 - Higher temperatures decrease predator's presence, causing a decline in fish populations.
 - Increased ocean temperatures reduce oxygen levels, affecting fish reproduction.
 - Warmer temperatures encourage the migration of fish to colder regions for breeding.
20. Consider a scenario where a city implements extensive water conservation methods, reducing wastewater released into rivers by 40%. If initially, 1,000 cubic meters of wastewater flowed into rivers per day, what would be the new daily volume released after conservation efforts?
- 1,400 cubic meters
 - 350 cubic meters
 - 600 cubic meters
 - 400 cubic meters
21. A community decides to implement a biomass energy system that uses organic materials to produce electricity. Which material among the following would be most suitable for this type of energy generation?
- Plastic waste
 - Glass bottles
 - Agricultural residues
 - Metal scraps

22. Amelia observed that during heavy rains, one part of the city experienced flash floods and drainage issues due to excessive concrete, while another region with abundant green spaces remained relatively unaffected. Why did the area with green spaces fare better?
- The city's overall topography favoured water runoff in green spaces.
 - Concrete areas had more efficient drainage systems in place.
 - Green spaces effectively absorbed excess water, preventing flooding.
 - The presence of concrete minimised water absorption, causing flooding.

23. Alex is reviewing a research paper on atmospheric gases. Which gases in the atmosphere contribute significantly to the greenhouse effect, aiding in climate regulation?

- | | |
|-------------------------------|------------------------|
| a. Oxygen and nitrogen | b. Nitrogen and helium |
| c. Carbon dioxide and methane | d. Hydrogen and argon |

24. A group of environmental scientists conducted a study on the significance of land-based environments in maintaining ecological balance. They explored various aspects ranging from biodiversity to human reliance on terrestrial ecosystems. During their research, the scientists observed a correlation between land-based environments and the overall health of marine ecosystems.

Choose an appropriate option that best reflects the importance of terrestrial ecosystems for marine life.

- Land-based environments have minimal impact on marine ecosystems, thus their significance is negligible.
- Terrestrial environments act as a buffer, filtering pollutants before they reach the oceans, thus preserving marine habitats.
- Marine ecosystems are entirely independent of land-based environments, having no ecological connections.
- Human activities in terrestrial ecosystems do not affect the quality of water in marine environments.

25. During science class, students learned about waste separation and its significance. Which practice best aligns with responsible waste separation?

- Mixing plastic, paper, and glass together in the same bin for collection.
- Composting food waste along with plastic wrappers.
- Discarding all waste in a single bin for easier disposal.
- Segregating waste into different bins for recycling and composting.

26. During a class project on ocean ecosystems, a student argued that overfishing only affects fish populations and doesn't influence other marine organisms. Which statement provides the most accurate perspective on this issue?

- Overfishing primarily affects larger fish species.
- Overfishing is beneficial as it controls predator populations.
- Overfishing can disrupt the entire marine food web.
- Overfishing has no significant impact on marine ecosystems.

27. In a particular forest, a new road was constructed, splitting the area into two smaller sections. This resulted in isolating a group of endangered species to one side. What phenomenon does this scenario represent?

- | | |
|---------------------|--------------------------|
| a. Deforestation | b. Habitat fragmentation |
| c. Overexploitation | d. Pollution |

28. Deep in the Amazon rainforest, a group of scientists are studying the impact of deforestation on jaguars. They discover that the once continuous forest is now fragmented into smaller, isolated patches. How will this fragmentation MOST likely affect the jaguar population?
- Jaguars will have more food available due to increased edge habitat.
 - Jaguars will adapt to smaller territories and maintain stable populations.
 - Jaguars will be more vulnerable to predators due to reduced cover.
 - Jaguars will migrate to new, untouched areas of the rainforest.
29. Hannah is researching the environmental impact of food choices. She notices that a diet high in animal products contributes significantly to greenhouse gas emissions. What dietary change could Hannah suggest to her community to reduce this impact?
- Promoting a solely plant-based diet to eliminate greenhouse gas emissions.
 - Encouraging the consumption of more red meat and dairy products.
 - Suggesting an increase in processed food consumption to reduce animal product intake.
 - Advocating for a balanced diet with moderate consumption of animal products.
30. What is the primary function of a hydroelectric power plant in generating electricity?
- Converting water flow into mechanical energy that directly powers turbines.
 - Storing water in reservoirs to control floods and generate electricity simultaneously.
 - Directly converting water pressure into electrical energy through underwater turbines.
 - Using water to cool down generators and facilitate electrical production.
31. The school cafeteria has decided to install energy-efficient appliances. They replaced the older refrigerator and cooking equipment with energy-star rated models. How might this change affect the school's energy consumption over a year?



- Increase significantly
 - Decrease gradually
 - No change
 - Fluctuate unpredictably
32. Imagine a bustling city facing the challenge of managing heavy rainfall. They implement a green infrastructure system, incorporating elements like bioswales and rain gardens. But what role do these play in keeping the city healthy and functioning smoothly?
- Diverting stormwater to increase flooding risks
 - Enhancing pollution in water bodies
 - Filtering and absorbing stormwater to prevent runoff pollution
 - Reducing access to green spaces for the community

33. You're at the grocery store and see two types of apples: organic and conventionally grown. Both look delicious. Which choice would be more sustainable?
- Both choices are equally sustainable; the growing methods have minimal impact on the environment.
 - Conventionally grown apples, as they are more affordable and readily available, reducing transportation emissions
 - Organic apples, as they often require fewer pesticides and chemicals, promoting soil health and biodiversity.
 - There is no difference in sustainability between organic and conventionally grown apples.
34. Using the information from the table, deduce the most likely observable consequence in a marine ecosystem. Consider the combined effects on the marine food chain and other species interactions.

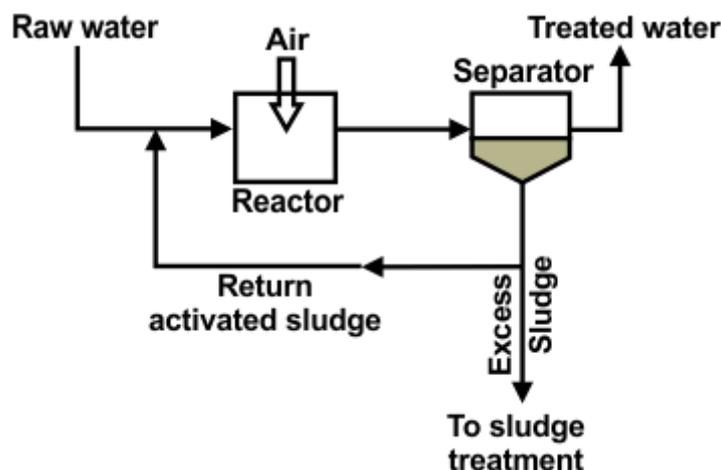
Pollutant	Impact on Marine Species
Oil	Coats and suffocates marine birds
Plastic	Causes entanglement and ingestion issues in sea animals
Heavy Metals	Lead to biomagnification in marine food chains
Nutrients	Result in algal blooms and dead zones

- A decrease in marine bird populations due to suffocation
 - A reduction in sea animal entanglement and ingestion issues
 - A significant drop in algal blooms and dead zones
 - An amplification of heavy metal concentration in top predators
35. At the Eco-Olympiad, a challenge tests students' knowledge of protein sources and their environmental impact. Which protein source would likely have the highest environmental impact?
- Tofu
 - Chicken
 - Lentils
 - Almonds
36. Which change in agricultural practices leads to more carbon dioxide being released into the atmosphere?
- Using crop rotation to improve soil health
 - Planting cover crops to prevent soil erosion
 - Clearing land for larger farms
 - Irrigating fields with recycled water
37. During a study of a deciduous forest, students encountered an interesting phenomenon related to tree species. They realised that certain trees played a vital role in supporting biodiversity. What specific characteristic of deciduous trees contributes to their importance in maintaining biodiversity, and how does it influence the forest ecosystem?
- Evergreen foliage; providing year-round shelter for diverse bird species and promoting avian diversity.
 - Rapid growth rates; outcompeting other plant species and enhancing overall plant diversity.
 - Climbing vines; offering vertical habitat structure and promoting arboreal animal diversity.
 - Seasonal leaf shedding; creating nutrient-rich leaf litter and supporting diverse decomposer communities.

38. In a lush rainforest, there is a diverse ecosystem with various plant and animal species. The interactions among these organisms involve multiple feeding relationships. What term best describes this intricate network of interconnected food chains?
- A diagram showing the transfer of energy in a straight line from one organism to another.
 - A sequence of organisms in an ecosystem, representing the transfer of energy from producers to consumers.
 - A network of interconnected food chains, showing the complex feeding relationships in an ecosystem.
 - A diagram illustrating the process of photosynthesis in plants.
39. Consider the following scenario in the context of food security and agriculture:
- In a region with unpredictable weather patterns, farmers are facing challenges in ensuring food security for the community. They are exploring different strategies to enhance agricultural productivity and resilience.
- Which of the following measures would be most effective in addressing the challenges and ensuring food security in this scenario?
- Introducing crop diversification to reduce vulnerability to weather fluctuations.
 - Relying solely on chemical fertilisers to boost crop growth.
 - Implementing a monoculture approach to focus on high-yielding crops.
 - Ignoring technological advancements and sticking to traditional farming methods.
40. In a small town, the local government implemented a waste reduction program. They observed a decrease in greenhouse gas emissions over the years. To what extent do dietary choices contribute to this positive change?
- No impact, as waste reduction is solely related to recycling efforts.
 - Significant impact, as certain food choices can result in lower carbon emissions.
 - Negligible impact, as emissions are primarily influenced by industrial activities.
 - Unrelated impact, as the waste reduction program focuses on non-food waste.

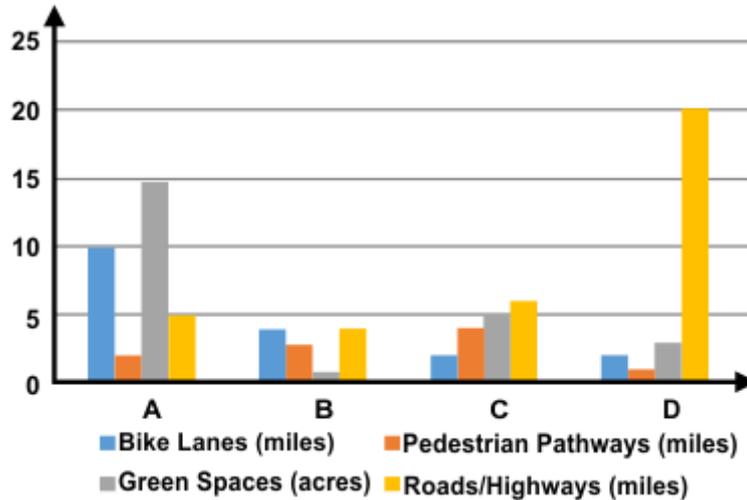
Green Challenger (Each Question is 6 Marks)

41. In a small-scale wastewater treatment experiment, a student used an activated sludge process to treat a sample of domestic wastewater as represented below. The student observed a significant reduction in the BOD levels. What is the role of activated sludge in this process?



- a. It introduces chemicals to disinfect the wastewater.
- b. It physically filters out impurities from the wastewater.
- c. It separates oil and grease from the wastewater.
- d. It provides a medium for the growth of microorganisms that break down organic matter.

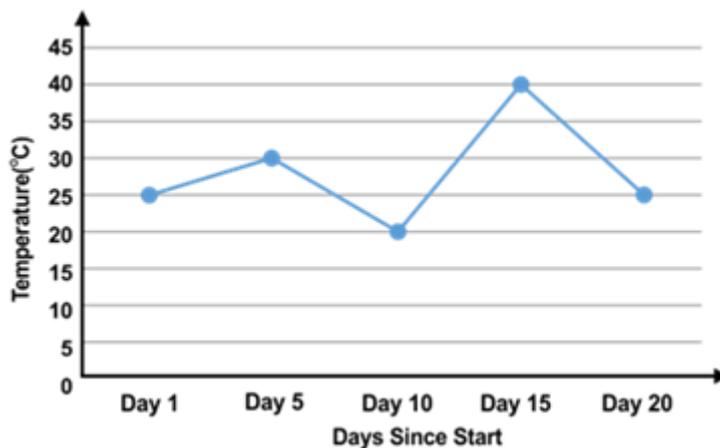
42. Consider the city planning graph below, showing the distribution of bike lanes, pedestrian pathways, and green spaces in a city. Which area is most sustainably developed?



- a. Area A
- b. Area B
- c. Area C
- d. Area D

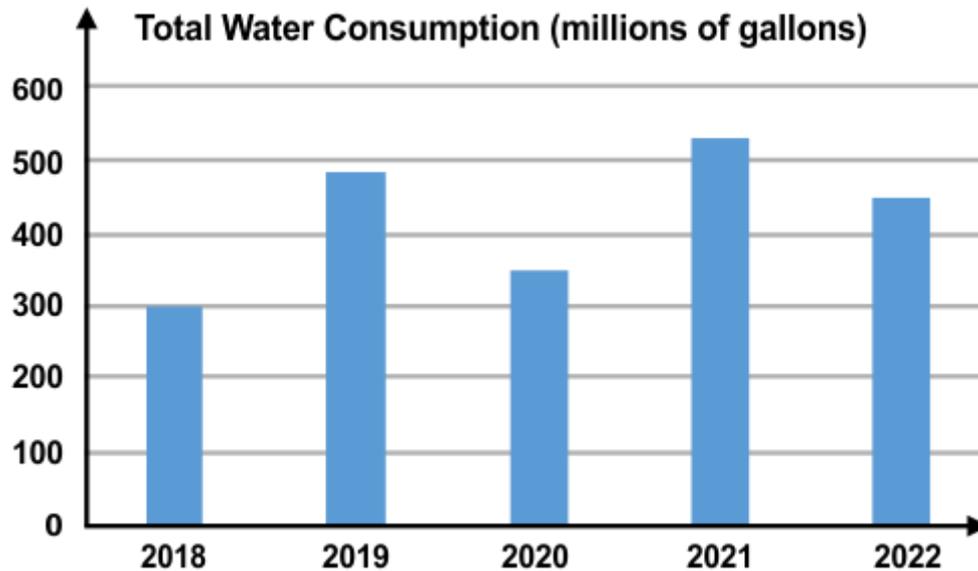
43. You've been tasked with managing a community composting project. Over a period of 20 days, you monitored the temperature changes within the compost pile.

Based on the data depicted in the graph below, what could be the likely reason behind the observed fluctuations in temperature throughout the composting process?



- a. Insufficient aeration leading to anaerobic conditions and temperature fluctuations.
- b. Adequate moisture levels causing microbial activity and temperature rise.
- c. Lack of moisture causing temperature variations as the decomposition process slows down.
- d. Lack of compostable materials resulting in temperature fluctuations due to microbial imbalance.

44. Analyse the graph below representing the water consumption patterns of a city over five years. Identify the trend in water consumption and propose a hypothesis explaining the observed pattern.



- a. Increasing trend; population growth leading to higher demand
b. Fluctuating trend; changes in climate affecting water availability
c. Decreasing trend; successful implementation of water conservation measures
d. Stable trend; consistent water usage habits in the community
45. Create an experiment using two plant pots, one covered with plastic wrap and the other left uncovered. Which observation would support the idea that greenhouse gases contribute to warming?
- a. The covered pot shows lower soil moisture compared to the uncovered one.
b. Both pots exhibit similar temperature increases.
c. The covered pot shows a greater temperature increase than the uncovered one.
d. Both pots show a decrease in temperature.
46. A research team investigated the effects of climate change on the migration patterns of marine species. What implications can changing migration patterns have on marine ecosystems, and how might this impact human communities reliant on these species for sustenance?
- a. Altered migration patterns might disrupt food chains, affecting species abundance and diversity in marine ecosystems
b. Changing migration patterns will have no significant impact on marine ecosystems
c. Human communities relying on these species can easily adapt to changes in migration patterns
d. Altered migration patterns will lead to increased catch and abundance of marine species, benefiting human communities

47. Sarah wanted to contribute to recycling efforts in her community. She collected various items like plastic bottles, glass jars, and old newspapers.
How should Sarah effectively segregate these items for recycling?
- Recycle all the magazines without thinking.
 - Throw away the magazines because they're old.
 - Reuse some magazines for crafts and recycle the rest.
 - Keep all the magazines because they're pretty.

48. At Greenfield Middle School, an initiative to reduce energy consumption was implemented by installing energy-saving devices.

The table given illustrates the electricity and gas consumption before and after the installation of these devices.

What is the percentage reduction in electricity consumption after the installation of energy-saving devices?

Energy Consumption (kWh)	Before Installation	After Installation
Electricity	450	300
Gas	200	150

- 25%
 - 33.33%
 - 50%
 - 66.67%
49. Your once-sunny city seems shrouded in a hazy cloud of smog, especially during winter. Cars and factories are the main culprits, but everyone suffers from breathing difficulties and reduced visibility. Which air pollutants from fossil fuels are likely contributing to this smog, and how can your city combat these issues?
- Fine particulate matter from car dust and industrial activities traps pollutants in the air, worsening smog. Investing in public transportation and green spaces can alleviate the problem.
 - Carbon dioxide, the main greenhouse gas from fossil fuels, directly contributes to smog, and the solution lies solely in switching to renewable energy sources like solar and wind.
 - Nitrogen dioxide and sulphur dioxide from vehicle exhausts and factory emissions combine with sunlight to form harmful smog, which can be tackled by promoting electric vehicles and stricter emission regulations.
 - Smog is primarily caused by natural phenomena like dust storms and forest fires, and the city should focus on preparing for these events rather than blaming fossil fuels.

50. Maya and Ethan analyse a table showing the decline of multiple endangered species, each facing different threats.
Based on the table, which of the following conservation strategies would likely be MOST effective for protecting ALL of the listed species?

Species	Primary Threat	Population Trend
Amur Leopard	Habitat loss and poaching	Decreasing
Black Rhinoceros	Poaching for horn	Slowly increasing
Sumatran Orangutan	Habitat loss from deforestation	Decreasing
Vaquita	Entanglement in fishing nets	Critically endangered

- Focusing solely on anti-poaching efforts.
- Establishing more protected areas to conserve habitat.
- Implementing sustainable fishing practices to reduce entanglement.
- Addressing multiple threats through a combination of conservation strategies.

Answer Key

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