

Environmental Studies – EVS – 2 Marks

PART-A

Dec-2020

1. Environmental (Environment)

The environment refers to everything that surrounds us, including living and non-living things. It consists of air, water, land, plants, animals, and humans. It provides resources necessary for life such as food, water, and shelter. The environment is divided into natural and man-made components. A healthy environment is essential for survival and well-being. Human activities can affect environmental balance.

2. Development

Development means improvement in the quality of life of people. It includes economic growth, better education, healthcare, and infrastructure. Sustainable development ensures that resources are used without harming future generations. It balances economic progress and environmental protection. Unplanned development can lead to pollution and resource depletion.

3. Food Chains

A food chain shows how energy flows from one organism to another. It starts with producers like plants, followed by consumers such as herbivores and carnivores. Each step is called a trophic level. For example: grass → deer → tiger. Food chains help maintain ecological balance. Disturbance in any level affects the whole chain.

4. Forest Ecosystem

A forest ecosystem is a natural system consisting of trees, plants, animals, and microorganisms. It provides habitat for wildlife and maintains biodiversity. Forests regulate climate, store carbon, and protect soil. They also help in water conservation. Human activities like deforestation disturb forest ecosystems.

5. Soil Erosion

Soil erosion is the removal of the top layer of soil by wind or water. It reduces soil fertility and affects agriculture. Causes include deforestation, overgrazing,

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and improper farming. It can lead to desertification and loss of nutrients. Soil conservation methods include planting trees and contour ploughing.

6. Biodiversity

Biodiversity refers to the variety of living organisms on Earth. It includes plants, animals, and microorganisms. It is important for ecosystem stability and human survival. Biodiversity provides food, medicine, and ecological services. Loss of biodiversity occurs due to pollution, deforestation, and climate change.

7. Ethical Values

Ethical values are moral principles that guide human behavior. In environmental studies, they promote respect and care for nature. Values like responsibility, conservation, and sustainability are important. Ethical practices help protect natural resources. They encourage people to reduce pollution and preserve biodiversity.

8. Endangered Species

Endangered species are animals or plants that are at risk of extinction. Causes include habitat loss, pollution, and hunting. Examples include tigers and elephants. Conservation efforts are needed to protect them. Wildlife protection laws and reserves help in their survival.

9. Water Pollution

Water pollution occurs when harmful substances contaminate water bodies. Sources include industrial waste, sewage, and agricultural chemicals. It affects aquatic life and human health. Polluted water is unsafe for drinking and agriculture. Prevention includes proper waste treatment and reducing pollutants.

10. Acid Rain

Acid rain is rainfall that contains harmful acids like sulfuric and nitric acid. It is caused by pollution from industries and vehicles. Acid rain damages plants, soil, and water bodies. It also corrodes buildings and monuments. Reducing emissions can control acid rain.

11. Environmental Movement

Environmental movements are efforts to protect nature and natural resources. They raise awareness about environmental issues. Examples include movements against deforestation and pollution. People, NGOs, and governments participate in such movements. They help promote conservation and sustainable practices.

12. Field Visit

A field visit is an educational trip to study the environment directly. It helps students observe nature and ecosystems. It provides practical knowledge about environmental issues. Field visits improve understanding and awareness. They encourage students to protect the environment.

DEC-2021**1. Environmental Science.**

Environmental Science is the study of the relationship between living organisms and their environment. It includes physical, chemical, and biological components such as air, water, soil, plants, animals, and humans. The main aim is to understand environmental problems and find solutions for conservation and sustainable development. It is interdisciplinary, combining biology, chemistry, geography, and ecology.

Example: Studying the effects of industrial pollution on river ecosystems and human health.

2. Sustainability.

Sustainability refers to the use of natural resources in a way that meets present needs without compromising the ability of future generations to meet their needs. It focuses on balancing environmental protection, economic growth, and social development. Sustainable practices reduce waste, conserve energy, and protect biodiversity.

Example: Using solar panels instead of fossil fuels to generate electricity.

3. Food Chains.

A food chain is a linear sequence that shows how energy and nutrients pass from one organism to another. It begins with producers (plants), followed by primary consumers (herbivores), secondary consumers (carnivores), and ends with top predators. Decomposers break down dead organisms and recycle nutrients back into the ecosystem. Example: Grass → Deer → Tiger → Decomposers

4. Renewable Energy.

Renewable energy is energy obtained from natural sources that are replenished continuously. It is eco-friendly and reduces pollution compared to fossil fuels. Common types include solar, wind, hydro, and biomass energy. These sources help in reducing global warming and conserving non-renewable resources.

Example: Wind turbines generating electricity in coastal areas.

5. Man – Wildlife Conflict.

Man–wildlife conflict occurs when human activities overlap with wildlife habitats, leading to competition for food, water, and space. It results in damage to crops, livestock loss, and sometimes human or animal deaths. Causes include deforestation, urbanization, and habitat destruction. Solutions include wildlife corridors, proper land-use planning, and awareness programs.

Example: Leopards entering urban areas in search of food.

6. Noise Pollution.

Noise pollution is the presence of excessive or disturbing sound that harms human health and the environment. Sources include traffic, industries, loudspeakers, and construction activities. It can cause hearing loss, stress, sleep disturbances, and reduced productivity. Control measures include using silencers, planting trees, and enforcing noise regulations.

Example: Loud honking in busy city roads affecting people's health.

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7. Forest Conservation Act.

The Forest Conservation Act was enacted to protect forests and prevent deforestation. It restricts the use of forest land for non-forest purposes without prior approval from the central government. The Act helps conserve biodiversity, maintain ecological balance, and reduce environmental degradation.

Example: Preventing large-scale clearing of forests for industrial projects without permission.

8. Human Welfare.

Human welfare refers to improving the quality of life of people through better health, education, sanitation, and environmental conditions. A clean environment is essential for human survival and well-being. Welfare programs focus on reducing poverty, ensuring access to clean water, and promoting public health.

Example: Government providing vaccination and clean drinking water facilities.

9. Study of Common Birds.

The study of common birds helps us understand biodiversity and ecological balance. Birds play important roles such as pollination, seed dispersal, and pest control. Observing their behavior, habitat, and feeding patterns gives insights into environmental health.

Example: Sparrows indicate a healthy environment, while vultures help in cleaning dead animals.

10. Silent Valley.

Silent Valley National Park is a tropical rainforest located in the Western Ghats. It is known for its rich biodiversity, including rare and endangered species. The area gained importance due to a successful environmental movement that stopped a hydroelectric project, helping preserve the ecosystem.

Example: Protection of lion-tailed macaque habitat in Silent Valley.

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11. Earthquake.

An earthquake is the sudden shaking of the Earth's surface caused by the movement of tectonic plates. It releases energy in the form of seismic waves. Earthquakes can cause destruction of buildings, loss of life, and environmental damage. Preparedness and proper construction can reduce risks.

Example: The 2001 Gujarat earthquake caused widespread damage.

12. Afforestation.

Afforestation is the process of planting trees in areas where there were no forests earlier. It helps increase green cover, reduce carbon dioxide levels, prevent soil erosion, and improve biodiversity. It is an important step in combating climate change.

Example: Planting trees on barren lands through government programs.

Dec-2022

1. Built Environment

1. Built environment refers to human-made surroundings such as buildings, roads, bridges, industries, parks, and cities.
 2. It is created to support human activities like living, transportation, and trade.
 3. Rapid urbanization increases pressure on natural resources and causes pollution.
 4. Proper planning helps in waste management, water conservation, and energy efficiency.
 5. Sustainable built environments include green buildings, public transport, and eco-friendly infrastructure.
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2. Food Webs

1. A food web is a network of interconnected food chains in an ecosystem.

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2. It shows how energy flows from producers to consumers and decomposers.
 3. Producers like plants form the base of the food web.
 4. Food webs maintain ecological balance and biodiversity.
 5. Disturbance to one organism can affect the entire ecosystem.
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3. Droughts

1. Drought is a prolonged period of very low rainfall causing water shortage.
 2. It affects agriculture, drinking water supply, and livestock.
 3. Causes include climate change, deforestation, and overuse of groundwater.
 4. Drought leads to famine, migration, and economic loss.
 5. Rainwater harvesting and water conservation help reduce drought effects.
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4. Wildlife

1. Wildlife includes all undomesticated plants and animals living in natural habitats.
 2. Wildlife maintains ecological balance and supports biodiversity.
 3. Major threats are deforestation, poaching, pollution, and climate change.
 4. National parks and wildlife sanctuaries help protect wildlife.
 5. Conservation awareness is necessary for protecting endangered species.
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5. Holocene Extinction

1. Holocene extinction is the ongoing extinction of species caused mainly by human activities.
2. It is also called the sixth mass extinction.

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3. Causes include habitat destruction, pollution, hunting, and global warming.
 4. Many species of plants and animals are becoming endangered.
 5. Conservation measures and sustainable development are needed to prevent further extinction.
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6. Pandemic

1. A pandemic is a disease outbreak spreading across many countries or continents.
 2. It affects a large number of people globally.
 3. Examples include COVID-19 and the Spanish Flu.
 4. Pandemics cause health, economic, and social problems.
 5. Vaccination, hygiene, and public health measures help control pandemics.
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7. Respiratory Infections

1. Respiratory infections affect the nose, throat, lungs, and airways.
 2. Common infections include influenza, pneumonia, and COVID-19.
 3. They spread through air droplets, coughing, and sneezing.
 4. Symptoms include cough, fever, breathing difficulty, and sore throat.
 5. Clean surroundings, masks, and vaccination help prevent infections.
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8. Tribal Culture

1. Tribal culture refers to the traditions, customs, and lifestyle of indigenous communities.
2. Tribes usually live close to forests and depend on natural resources.
3. They have unique languages, dances, arts, and religious beliefs.
4. Tribal communities play an important role in biodiversity conservation.

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5. Modernization and deforestation threaten tribal culture and identity.
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9. Demography

1. Demography is the scientific study of human population.
 2. It includes population size, density, birth rate, and death rate.
 3. Rapid population growth increases pressure on natural resources.
 4. Demographic studies help in planning health, education, and employment.
 5. Population control and awareness improve sustainable development.
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10. Bishnoi Faith

1. Bishnoi faith was founded by Guru Jambheshwar in Rajasthan.
 2. It teaches protection of trees, wildlife, and nature.
 3. Bishnois are known for conserving blackbucks and khejri trees.
 4. The community follows 29 principles promoting environmental protection.
 5. Bishnoi tradition is an example of eco-friendly living and conservation ethics.
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11. Manmade Disasters

1. Manmade disasters are caused by human activities and negligence.
 2. Examples include industrial accidents, oil spills, nuclear disasters, and fires.
 3. They cause loss of life, property damage, and environmental pollution.
 4. Poor safety measures and lack of awareness increase disaster risks.
 5. Proper planning, safety regulations, and emergency management reduce such disasters.
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12. Agricultural Production

- 1. Agricultural production means cultivation of crops and rearing of animals for food and raw materials.**
 - 2. It is essential for food security and the economy.**
 - 3. Modern agriculture uses fertilizers, irrigation, and machinery to increase yield.**
 - 4. Excessive chemical use can harm soil, water, and biodiversity.**
 - 5. Sustainable farming practices help maintain long-term agricultural productivity.**
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May 2021

1. Natural Resources

Natural resources are materials provided by nature that are useful to humans for survival and development. These include air, water, soil, minerals, forests, and wildlife. They are classified into renewable (like sunlight, wind) and non-renewable (like coal, petroleum). Overuse of natural resources leads to depletion and environmental imbalance. Conservation methods such as recycling, afforestation, and sustainable usage are necessary. Thus, natural resources must be used wisely for future generations.

2. Multidisciplinary Approach

A multidisciplinary approach involves using knowledge from different fields to solve environmental problems. Environmental issues are complex and require inputs from science, economics, sociology, and politics. For example, solving pollution involves scientific research, government policies, and public awareness. This approach ensures better understanding and effective solutions. Therefore, it is essential for sustainable development.

3. Desert Ecosystems

Desert ecosystems are regions with very low rainfall and extreme temperatures. Vegetation is sparse, and plants like cacti are adapted to conserve water. Animals such as camels and reptiles survive with minimal water. The soil is sandy and lacks nutrients. Despite harsh conditions, deserts support a unique biodiversity. These ecosystems are fragile and easily disturbed by human activities.

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4. Estuaries

Estuaries are coastal areas where freshwater from rivers mixes with seawater. They are rich in nutrients and support diverse plant and animal life. Examples include mangroves and fish breeding grounds. Estuaries act as natural filters and protect coastlines from storms. However, they are threatened by pollution and urban development. Conservation of estuaries is important for ecological balance.

5. Droughts

A drought is a prolonged period of insufficient rainfall leading to water scarcity. It affects agriculture, drinking water supply, and ecosystems. Causes include climate change, deforestation, and poor water management. Effects include crop failure, famine, and migration. Prevention measures include rainwater harvesting and efficient water use. Proper planning can reduce drought impacts.

6. Endangered Species

Endangered species are plants or animals at risk of extinction. Causes include habitat destruction, pollution, poaching, and climate change. Examples include tigers and elephants. Protecting these species is important for maintaining biodiversity. Conservation methods include wildlife sanctuaries, laws, and awareness programs. Saving endangered species ensures ecological balance.

7. Air Pollution

Air pollution is the contamination of air by harmful substances like gases, dust, and smoke. Sources include vehicles, industries, and burning of fuels. It causes health problems such as respiratory diseases and global issues like climate change. Measures to control air pollution include using clean energy, planting trees, and reducing emissions. Clean air is essential for life.

8. Environmental Ethics

Environmental ethics is the study of moral principles guiding human interaction with nature. It emphasizes protecting the environment and respecting all living beings. It promotes sustainable practices and conservation. Humans have a responsibility to preserve nature for future generations. Ethical behavior leads to a healthier environment.

9. Cyclone

A cyclone is a powerful storm with strong winds and heavy rainfall, usually formed over oceans. It can cause flooding, destruction of property, and loss of life. Cyclones are

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classified based on wind speed. Early warning systems and disaster management reduce damage. Coastal areas are most affected. Preparedness is key to minimizing impacts.

10. Study of Common Plants

The study of common plants involves observing their structure, growth, and functions. Plants have parts like roots, stems, leaves, flowers, and fruits. Each part has a specific role, such as photosynthesis and reproduction. Studying plants helps understand biodiversity and ecological balance. It also supports agriculture and medicine. Plants are essential for life on Earth.

11. Agricultural Polluted Site

An agricultural polluted site is land contaminated due to excessive use of fertilizers, pesticides, and chemicals. These pollutants degrade soil quality and harm crops and organisms. Runoff from such sites pollutes water bodies. Long-term effects include reduced fertility and health hazards. Sustainable farming methods like organic farming can reduce pollution.

12. Industrial Waste

Industrial waste consists of harmful materials released from factories and industries. It includes chemicals, metals, and toxic substances. Improper disposal leads to soil, water, and air pollution. It can harm human health and ecosystems. Treatment and proper waste management are necessary. Recycling and regulations help reduce industrial waste impact.

MAY-2022

1. Natural Environment

The natural environment includes all living and non-living components that occur naturally on Earth. It consists of air (atmosphere), water (hydrosphere), land (lithosphere), and living organisms (biosphere). These components interact with each other to maintain ecological balance. The natural environment provides essential resources like food, water, and shelter for all living beings. It also supports biodiversity and regulates climate. Human activities can disturb this balance, leading to environmental problems.

2. Resource Management

Resource management refers to the proper use, conservation, and sustainable utilization of natural resources. It ensures that resources like water, forests, and minerals are used efficiently without depletion. The main aim is to meet present needs without affecting future generations. Techniques include recycling, conservation, and use of renewable resources. It also involves planning and policymaking. Proper management helps maintain ecological balance and economic development.

3. Silviculture

Silviculture is the scientific method of growing and managing forests. It involves planting, protecting, and harvesting trees in a planned way. The goal is to improve forest quality and productivity. It includes practices like reforestation and afforestation. Silviculture helps in maintaining biodiversity and ecological stability. It also provides timber, fuel, and other forest products. Sustainable silviculture reduces deforestation and environmental damage.

4. Rainfall

Rainfall is the process of water falling from clouds in the form of rain. It is a major part of the water cycle. Rainfall is measured using a rain gauge in millimeters. It is essential for agriculture, drinking water, and maintaining ecosystems. The amount and distribution of rainfall affect climate and crop production. Irregular rainfall can lead to droughts or floods. Thus, it plays a key role in environmental balance.

5. Habitat

A habitat is the natural place where an organism lives. It provides food, water, shelter, and suitable conditions for survival. Habitats can be terrestrial (land) or aquatic (water). Each species is adapted to its specific habitat. Destruction of habitats leads to loss of biodiversity. Human activities like deforestation and pollution harm habitats. Protecting habitats is important for conservation.

6. Soil Erosion

Soil erosion is the removal of the fertile top layer of soil by wind, water, or human activities. It reduces soil fertility and agricultural productivity. Causes include deforestation, overgrazing, and improper farming. It can lead to desertification and loss of vegetation. Soil erosion also causes water pollution by carrying sediments. Preventive measures include planting trees, contour ploughing, and terracing. Conservation of soil is essential for sustainable agriculture.

7. Mining

Mining is the extraction of minerals and metals from the Earth. It is important for industrial and economic development. Types include surface mining and underground mining. However, mining causes environmental damage like deforestation, soil erosion, and water pollution. It also affects human health. Proper regulations and sustainable practices are necessary. Rehabilitation of mined areas is also important.

8. Poaching

Poaching is the illegal hunting or capturing of wild animals. It is mainly done for skins, bones, horns, or other valuable parts. Poaching threatens endangered species and reduces biodiversity. It disrupts ecological balance. Strict laws and wildlife protection acts are used to control it. Awareness and

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conservation programs help reduce poaching. Protecting wildlife is essential for maintaining ecosystems.

9. Tiger Conservation

Tiger conservation involves protecting tigers and their natural habitats. Tigers are endangered due to poaching and habitat loss. Conservation programs like Project Tiger in India aim to increase tiger population. It includes creating protected areas and wildlife reserves. Conservation helps maintain ecological balance as tigers are top predators. Public awareness and strict laws are important. Protecting tigers also protects biodiversity.

10. Air Pollution

Air pollution is the presence of harmful substances in the air. Pollutants include gases like carbon monoxide, sulfur dioxide, and particulate matter. It is caused by vehicles, industries, and burning of fuels. Air pollution affects human health, causing respiratory diseases. It also harms plants and animals. It contributes to global warming and climate change. Control measures include reducing emissions and using clean energy.

11. Acid Rain

Acid rain is rain that contains acids formed from sulfur dioxide and nitrogen oxides. These gases come from industries and vehicles. Acid rain harms plants, soil, and aquatic life. It damages buildings and monuments. It also affects human health indirectly. Controlling emissions can reduce acid rain. Using cleaner fuels and technologies is important.

12. Silent Valley National Park

Silent Valley is a tropical rainforest located in Kerala. It is known for its rich biodiversity and rare species. The area was saved from a hydroelectric project due to environmental movements. It is an important conservation area in India. The forest remains largely undisturbed by human activities. It is home to endangered species like the lion-tailed macaque. Silent Valley represents successful environmental conservation.

MAY -2023

1. Environmental Science.

Environmental Science is an **interdisciplinary field of study** that examines the interactions between the **natural environment** (air, water, land, plants, and animals) and **human activities**, with the aim of **understanding environmental problems and finding sustainable solutions**.

Key points

Combines subjects like biology, chemistry, physics, and geography

- Studies ecosystems, biodiversity, and natural resources

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- Focuses on environmental issues such as pollution and climate change
 - Promotes conservation and sustainable development • Helps in protecting the environment and improving human life
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2. Timber Management.

Timber management refers to the **planned use, conservation, and sustainable harvesting of forest wood (timber)** to meet human needs while protecting the environment.

Objectives:

- Ensure continuous supply of timber
- Prevent deforestation
- Maintain ecological balance
- Conserve biodiversity

Methods of Timber Management:

- **Selective cutting** – Only mature trees are cut
- **Clear cutting with replanting** – Trees are replanted after cutting
- **Afforestation and reforestation** – Planting new trees
- **Forest protection measures** – Prevent fires, illegal logging, pests

Importance:

- Provides raw material for industries (furniture, paper)
 - Maintains soil fertility and prevents erosion
 - Supports wildlife habitat • Helps in climate regulation
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3. Ground Water.

Groundwater is the water present **below the Earth's surface** in the pores of soil and rocks. It is stored in underground layers called **aquifers**.

Sources of Groundwater:

- Rainwater infiltration
- Seepage from rivers, lakes, and ponds
- Irrigation return flow

Importance:

- Major source of drinking water
- Used for agriculture and irrigation

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- Supports industries
- Maintains rivers and wetlands during dry periods

Problems:

- Over-extraction leading to depletion
- Pollution from chemicals, sewage, and pesticides
- Lowering of water table

Conservation Methods:

- Rainwater harvesting
- Controlled use of water
- Artificial recharge of aquifers
- Preventing pollution

4. Sustainable Development Goals.

The **Sustainable Development Goals (SDGs)** are a set of **17 global goals** adopted by the United Nations in **2015** under the 2030 Agenda for Sustainable Development to achieve a better and sustainable future for all by **2030**.

Objectives:

- End poverty and hunger
- Protect the environment
- Ensure peace and prosperity
- Promote equality and well-being

Key Goals (examples):

- No Poverty
- Zero Hunger
- Good Health and Well-being
- Quality Education
- Clean Water and Sanitation
- Climate Action

Importance:

- Addresses global challenges like poverty, inequality, and climate change
- Promotes sustainable use of resources
- Encourages international cooperation
- Ensures balanced economic, social, and environmental development

5. Soil Pollution.

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Soil pollution is the **contamination of soil** by harmful chemicals, wastes, or pollutants that affect its fertility and living organisms.

Causes:

- Excessive use of fertilizers and pesticides
- Industrial waste and chemicals
- Improper disposal of solid waste
- Oil spills and mining activities

Effects:

- Loss of soil fertility
- Reduced agricultural productivity
- Harm to microorganisms and plants
- Entry of toxins into the food chain (affecting human health)

Control Measures:

- Use of organic manure and bio-fertilizers
- Proper waste disposal and recycling
- Controlled use of chemicals

6. Polluter Pays Principle.

The **Polluter Pays Principle (PPP)** states that **the person or organization responsible for pollution must bear the cost of managing and controlling it**, to prevent damage to the environment and public health.

Key Features:

- Polluters are financially responsible for environmental damage
- Includes cost of prevention, control, and cleanup
- Encourages industries to reduce pollution
- Promotes accountability

Objectives:

- Protect the environment
- Reduce pollution levels • Ensure sustainable development

Applications:

- Fines and penalties for industries causing pollution
- Payment for environmental restoration
- Waste management charges
- Discourages harmful practices

Importance:

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Promotes eco-friendly technologies

- Ensures fairness (polluter bears cost, not society)

7. Climate Change.

Climate change refers to the **long-term alteration in temperature, rainfall, and weather patterns** of the Earth, mainly caused by human activities.

Causes:

- Burning of fossil fuels (coal, oil, gas)
- Deforestation
- Industrialization and vehicle emissions • Increase in greenhouse gases (CO₂, methane)

Effects:

- Rise in global temperature (global warming)
- Melting of glaciers and rising sea levels
- Extreme weather events (floods, droughts, cyclones)
- Loss of biodiversity

Control Measures:

- Use of renewable energy (solar, wind)
- Afforestation and forest conservation
- Reduction of carbon emissions
- Energy conservation and sustainable practices

8. Nature Reserves.

nature reserves are **protected areas of land or water** set aside to conserve wildlife, plants, and natural ecosystems.

Objectives:

- Protect biodiversity and endangered species
- Preserve natural habitats
- Maintain ecological balance
- Support scientific research and education

Types:

- Wildlife sanctuaries
- National parks • Biosphere reserves

Importance:

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Conserves flora and fauna

- Prevents extinction of species
- Maintains natural resources • Promotes eco-tourism and awareness

Examples (India):

- Kaziranga National Park
- Gir National Park • Sundarbans National Park

9. Landslides.

Landslides are the **downward movement of rock, soil, or debris** along a slope due to gravity.

Causes:

- Heavy rainfall and flooding
- Earthquakes and volcanic activity
- Deforestation
- Construction and mining activities

Effects:

- Loss of human life and property
- Damage to roads, buildings, and infrastructure
- Soil erosion and loss of fertile land
- Disruption of transportation and communication

Prevention Measures:

- Afforestation and vegetation cover
- Proper drainage systems
- Avoid construction on steep slopes • Building retaining walls and barriers

10. Environmental Conservation.

Environmental conservation refers to the **protection, preservation, and sustainable use of natural resources** to maintain ecological balance and ensure availability for future generations.

Objectives:

- Protect natural resources (air, water, soil, forests)
- Preserve biodiversity
- Maintain ecological balance

Promote sustainable development

Methods:

- Afforestation and reforestation

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- Wildlife conservation and protected areas
- Pollution control measures
- Use of renewable resources
- Public awareness and environmental education

Importance:

- Ensures survival of living organisms
- Prevents environmental degradation
- Maintains climate stability
- Supports economic and social development

11. CNG Vehicles.

CNG (Compressed Natural Gas) vehicles are automobiles that use **compressed natural gas as fuel** instead of petrol or diesel.

Features:

- Natural gas is stored under high pressure in cylinders
- Burns more cleanly compared to conventional fuels
- Produces fewer harmful emissions

Advantages:

- Environment-friendly (low air pollution)
- Reduces greenhouse gas emissions
- Cost-effective compared to petrol and diesel
- Less engine wear and maintenance

Disadvantages:

- Limited availability of CNG filling stations
- Lower mileage compared to petrol/diesel vehicles
- Requires special storage cylinders
- Initial conversion cost is high

Importance:

- Helps in reducing urban air pollution
- Promotes cleaner and sustainable transport

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12. Ponds.

Ponds are **small, shallow freshwater bodies** formed naturally or artificially, which support a variety of plants and animals.

Characteristics:

- Shallow depth allows sunlight to reach the bottom
- Contains still or slow-moving water
- Rich in aquatic life

Components of Pond Ecosystem:

- **Producers** – Algae, aquatic plants
- **Consumers** – Fish, insects, frogs • **Decomposers** – Bacteria and fungi

Importance:

- Supports biodiversity
- Helps in groundwater recharge
- Provides water for irrigation and domestic use
- Acts as a natural habitat for many species

Threats:

- Pollution from waste and chemicals
- Encroachment and urbanization
- Overuse and neglect

May -2024

PART-A

1. Environmental Science.

***Definition*:** Environmental Science is the interdisciplinary study of the environment and how physical, chemical, and biological processes interact with living organisms, including humans.

***Scope*:** It combines biology, chemistry, physics, geology, geography, and social sciences to understand environmental problems like pollution, climate change, deforestation, and biodiversity loss.

***Importance*:** Helps us develop sustainable solutions, create environmental policies, conserve natural resources, and understand human impact on ecosystems.

***Key areas*:** Pollution control, waste management, conservation of biodiversity, renewable energy, and environmental impact assessment.

2. Aquatic Ecosystem.

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- ***Definition***: Ecosystem where plants and animals interact with each other and with water.

Types:

1. ***Freshwater*** - Ponds, lakes, rivers. Low salt content.

2. ***Marine*** - Oceans, seas. High salt content.

- ***Simple food chain***: Algae → Small fish → Big fish → Decomposers.

- ***Importance***: Gives us fish, maintains rainfall, absorbs CO₂, home to 50% of world's species.

- ***Example***: In a pond, lotus is a producer, frog and fish are consumers, bacteria are decomposers.

3. Oceans.

- ***Definition***: Oceans are large, continuous bodies of salt water that cover about 71% of Earth's surface.

- ***Types***: Five main oceans - Pacific, Atlantic, Indian, Southern, and Arctic. Pacific is the largest.

- ***Importance***:

1. ***Climate control*** - Absorb heat and CO₂, control weather and rainfall.

2. ***Biodiversity*** - Home to fish, whales, coral reefs, and millions of species.

3. ***Resources*** - Provide food, salt, minerals, oil, and transport routes.

4. ***Oxygen*** - Marine plants like phytoplankton produce over 50% of Earth's oxygen.

- ***Threats***: Pollution, overfishing, oil spills, and plastic waste harm ocean life.

4. Mining.

- ***Definition***: Mining is the process of extracting minerals, metals, and other valuable materials from the earth.

- ***Types***:

1. ***Surface mining*** - Open pit mining for coal, iron. Used when minerals are near surface.

2. ***Underground mining*** - Deep shafts and tunnels for gold, diamonds.

- ***Importance***: Provides raw materials for industries, fuel like coal, construction materials, and jobs.

- ***Environmental effects***: Causes deforestation, soil erosion, water pollution, air pollution, and loss of biodiversity. Also leads to land degradation.

- ***Solution***: Reforestation, proper waste disposal, and sustainable mining practices.

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5. Biodiversity Hot Spots.

- ***Definition*:** Regions with a very high number of different plant and animal species, but are under threat from humans. Term given by Norman Myers.
 - ***Conditions*:** Must have at least 1500 endemic plant species and lost 70% of its original habitat.
 - ***Importance*:** Cover only 2.4% of Earth but support 50% of all plant species and 42% of all animal species.
 - ***Examples*:** In India - Western Ghats and Himalayas. World total is 36 hot spots.
 - ***Threats*:** Deforestation, pollution, climate change, and urbanization. Need conservation to protect them.
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6. Pollution Control.

- ***Definition*:** Pollution control means the methods and measures used to reduce or prevent harmful substances released into the environment.
 - ***Types of pollution controlled*:** Air, water, soil, and noise pollution.
 - ***Methods*:**
 1. ***Air*** - Use filters in factories, CNG vehicles, plant trees.
 2. ***Water*** - Treat sewage before release, ban dumping waste in rivers.
 3. ***Soil*** - Reduce chemical fertilizers, recycle plastic waste.
 4. ***Noise*** - Limit loudspeaker use, plant trees as sound barriers.
 - ***Importance*:** Protects human health, saves wildlife, keeps air and water clean for future generations.
 - ***3 R's*:** Reduce, Reuse, Recycle is the basic principle of pollution control.
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7. Global Warming.

- ***Definition*:** Global warming is the gradual increase in Earth's average temperature due to excess greenhouse gases in the atmosphere.
- ***Main causes*:** Burning fossil fuels like coal, petrol, deforestation, industries, and vehicle smoke. Gases like CO₂, methane, and CFCs trap heat.
- ***Effects*:**
 1. Melting of glaciers and rise in sea level.
 2. Climate change, floods, droughts, and heatwaves.
 3. Loss of biodiversity and coral bleaching.
 4. Impact on agriculture and human health.

Environmental Studies – EVS – 2 Marks

- ***Control measures***: Plant more trees, use renewable energy like solar and wind, reduce vehicle use, stop deforestation, and follow 3R principle.

8. Montreal Protocol.

- ***Definition***: International agreement signed in 1987 to protect the ozone layer by controlling ozone-depleting substances.
- ***Reason***: Chemicals like CFCs, halons, and carbon tetrachloride were damaging the ozone layer, causing ozone hole over Antarctica.
- ***Aim***: Phase out the production and use of CFCs and other ODS in refrigerators, ACs, and spray cans.
- ***Result***: Very successful. Ozone layer is slowly recovering. Over 190 countries signed it.
- ***Importance***: First global treaty to solve an environmental problem. Kigali Amendment in 2016 added HFCs to the list.

9. Landslides.

- ***Definition***: Landslides are the sudden downward movement of rock, soil, and debris along a slope due to gravity.
- ***Causes***:
 1. ***Natural*** - Heavy rainfall, earthquakes, volcanic eruptions.
 2. ***Human*** - Deforestation, mining, construction on hills, and blasting.
- ***Effects***: Loss of life and property, road blocks, damage to crops, change in river flow, and soil erosion.
- ***Prevention***: Afforestation on slopes, proper drainage, retaining walls, avoid construction in risky areas, and early warning systems.
- ***Prone areas***: Himalayan region, Western Ghats, and Nilgiris in India.

10. Silent Valley.

- ***Location***: Silent Valley National Park is in Palakkad district, Kerala, in the Western Ghats.
- ***Speciality***: Tropical evergreen rainforest with high biodiversity. Named “Silent” because there are no cicadas here.
- ***Importance***: Home to rare species like Lion-tailed macaque, Nilgiri langur, and many endemic plants. Part of Nilgiri Biosphere Reserve.
- ***Movement***: Famous “Save Silent Valley Movement” in 1970s stopped a hydroelectric dam project to protect the forest. People like Dr. Salim Ali supported it.

Environmental Studies – EVS – 2 Marks

- ***Result***: Declared a National Park in 1984. Shows importance of people's role in conservation.

11. CNG Vehicle.

- ***Full form***: CNG means Compressed Natural Gas.
- ***Definition***: Vehicles that use CNG as fuel instead of petrol or diesel. CNG is stored in high pressure tanks.
- ***Advantages***:
 1. ***Less pollution*** - Produces less CO, CO₂, and almost no smoke or lead.

2. ***Cheaper*** - Cost per km is lower than petrol/diesel.
 3. ***Safer*** - Lighter than air, so it disperses quickly if leaked.
 4. ***Engine life*** - Causes less wear and tear in engines.
- ***Example***: Used in Delhi buses, autos, and cars to reduce air pollution. Supreme Court made CNG mandatory for public transport in Delhi.
 - ***Disadvantage***: Needs large storage tank, fewer filling stations.
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12. Agricultural Pollution.

- ***Definition***: Pollution caused by farming activities that release harmful substances into air, water, and soil.
 - ***Main causes***:
 1. ***Chemical fertilizers*** - Excess nitrogen and phosphorus run off into rivers, causing eutrophication.
 2. ***Pesticides/insecticides*** - DDT and other chemicals kill useful insects and enter food chains.
 3. ***Animal waste*** - Manure from farms pollutes water with bacteria and nitrates.
 4. ***Burning crop residue*** - Causes air pollution and smog.
 - ***Effects***: Water pollution, soil degradation, loss of soil fertility, health problems in humans, and death of aquatic life.
 - ***Control***: Use organic farming, biofertilizers, crop rotation, drip irrigation, and integrated pest management.
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