Q.1 Define Environment Science. Describe Scope & importance of Environmental studies.

Environment science -

Environment science is the study of the environment and the interaction between living Organisms (plants, Animal, humans) and their surroundings such as air, Water and Land.

Scope of Environment science

- Study help in understanding total living and non-living content around environment.
- Help in understanding local and geographical distribution and abundance of organisms.
  Eg. Tea, Apple etc.
- Environmental studies are concentrated on temporal change in occurances, abundance and activities of an Organisms.
  Eg. Flemingo birds.
- Environmental studies mean study of organisms under Natural condition called ethology
  Eg. Crops, Penguins, African lions.
- Environmental studies take into account interrelation between organisms in population & Communities called populations energy.

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- Environmental science basically study the biological productivity of Nature and it serves mankind called ecosystem ecology.
  e.g oil, coal, gold, food etc.
- Disaster Management - strategies for handlings Natural disasters like floods, earthquakes and droughts.
- Evolutionary ecology :- Evolutory Development.
  Eg. Homosapiens

Importances

- Help to understand relation between biotic and biotic components of universe.
- Helps in Maintenaces of life and health in self preservations and protection of human race.
- Helps to understand different food chain, food web, ecological Niche so that ecological balances can be Maintained.
- Helps in Environmental Management.
- Helps to understand beauty of Nature and social values of Nature.
- It helps in solving problems & human attention towards.

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- a) Population explosion
- b) Pollution air, water & soil
- c) Exhaustion of Natural sources

Q.2 Describe in short about different layers of Atmosphere.

The Atmosphere is divided into five Main layers based on Temperature & altitude.

1. Troposphere

- The lowest layers of the Atmosphere.
- Extends From Earth's surface up to about 8-18 km
- Weather change like rain, cloud, and Wind occurs Here.
- Most air and Water Vapor are present in this layers.

2. Stratosphere

- Located above the Troposphere (about 18-50 km)
- contains the ozone layers, which protects Earth from harmful UV rays.
- Airplanes often fly in this layer because it is More stables.

3. Mesosphere

- About 40 km in height, Next to stratosphere is called mesosphere.

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• upper transitional isothermal layers of this zone is called mesopause.

4. Thermosphere / Ionosphere -

• The rest above the mesosphere upto the height of about 300 km above earth surface is Ionosphere.
• Temperature is very high here.

5. Exosphere

• The outermost layer of the atmosphere.
• Extends from about 500 km to 10,000 km.
• Air is very thin & mostly contains Hydrogen and Helium.

Q.3 Describe in details segment of Environment. (Sphere of component of Atmosphere).

The environment is made up of 4 Component.

1. Atmosphere

The atmosphere is the gaseous layer surrounding the earth. it is composed mainly of Nitrogen (78%), Oxygen (21%), Carbon dioxide, Water vapour & other gases

• Provide oxygen for respiration and Carbon dioxide for photosynthesis.
• Protect the earth From harmful ultraviolet rays of the sun.

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- Helps regulate temperature, and climate.
- Responsible for weather phenomena such as rain, wind and storms.

2. Lithosphere

- The lithosphere is the layer of outer solid layer of the earth, consisting of rocks, minerals & soil.
- It forms the land surface on which plant, Animal & humans live.
- Provides soil Necessary for plant growth & Agriculture.
- source of minerals, fossil fuels, and Natural resources.
- support terrestrial ecosystems and humas settlement

3. Hydrosphere

- The Hydrosphere includes all forms of water on earths.
- It is in the form of rivers, Oceans, lakes, ground water.
- essential for the survival of all living organisms
- Maintain the water cycle and regulates climate

4. Biosphere

- The Biosphere is the zone of life on earth where living organisms exists.
- It includes plant, animals and microorganisms that interact with each other.
- Maintain ecological balances.
- Support food chain and ecosystem.

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Q.4 What is mean by Natural resources gives details classification of Natural resources with suitable Examples.

Natural Resource - Natural resources are the Material available in Nature that are useful for human life and development is called Natural resource.

classification of Natural resources.

1) Based on Availability.

A] Reneawable resources → Resources that can be replenished Naturally in a short time.

Ex-, solar energy, Forests, Biomass.

B] Non-reneawable resources → Resources that Cannot be replenished quickly and take millions of years to Form.

Ex-, Coal, Natural gas, iron, copper, gold

2) Based on origin

A] Biotic Resources → These resources are obtained From living Organisms.

Ex, Forest., Animals, fish, Fossils.

B] Abiotic Resources - These resources are obtained

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From non-living components of Nature.

Ex:, Air, Water, soil, Mineral

3) Based on stages of Development.

A] Potential Resources

Resources that exists in a region but are not yet Fully ~~Resources that exists~~ used.

Ex:, solar energy in deserts, Wind energy in Coastal area.

B] Actual Resources

Resources that are surveyed, quantified and Currently used.

Ex:, Coal mines in India.

C] stock Resources

Available but Technology is not Available to used them fully

Ex:, Hydrogen in Water as a Fuel.

D] Reserves

part of stock that can be used with current Technology but saved for Future

Ex:, Water stored in dams.

4] Based on Distribution

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a) Ubiquitous Resources – Resources Found everywhere
Ex.., Air, sunlight.

b) localized Resources – Resources Found only in specific places
Ex.., Coal, iron, ore, Petroleum.

Q.5 Write in detail about Need of Forests in today's era and the Causes behind deforestration

Need of Forest in Today's Era
Forest are the one of the most important Natural resources on earth. They play a vital role in Maintaining ecological balance, biodiversity, and Human Welfare.

1) Maintain ecological Balance
Forests Help Maintain the balances between oxygen & Carbon dioxide in the atmosphere through photosynthesis.

2) climate Regulation
Forest help regulates temperature, rainfall & climate reduces the effects of global warming by absorbing carbon dioxide.

3) Soil Conservation
Tree roots bind the soil & prevent soil erosion.

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4] Habitat and Wildlife
Forest provide shelter and Food for various plants, animals, birds & microorganisms. Thus Maintain biodiversity.

5] Water cycle Maintenace
Forests help in Maintaining the Water cycle by increasing rainfall & protecting Water resources.

6] Livelihood Support
Millions of people, especially tribal & rural Communities depend on forests for their livelihood

Causes of Deforestation

1) Development Project - Rapid growth of cities, industries & infrastructure lead to cutting of Forests.

2) Mining Operation - It reduces Forests area
ex. Mica, coal, lime stone.

3] Raw Material for industries - Wood is an a important Raw material For various purpose
ex.., Making boxes, Furniture & paper.

4] Overgrazing - large Number of animal grazing in Forests damages vegetations & prevents New plant growths.

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5] Forests Fire - Natural or human caused Fires destroyed larges Forest areas.

Q.6 Write classification of Natural resources along with examples. Explain consequence of deforestration

Classification of Natural Resources.

I) Based on Availability.

i) Renewable resources
Ex., solar energy, Forest Biomass

II) Based on origin

i) Biotic resources
Ex., Forest, animal

ii) Abiotic resources
Ex..., Water, Air, soil

III) Based on stages of Development

i) Potential Resources
Ex., solar energy in desert

ii) Actual Resources
Ex., coal mines in india

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iii) stock Resources → Hydrogen in water as a Fuel.
iv) Reserves → Water stores in dams.

IV) Based on Distribution.

i) ubiquitous resources → Ex. Air, sunlight.
ii) localized resources → Ex. Petrolium, coal

Consequences of Deforestration

1) loss of Biodiversity.

Forests are home to many plants, animals & Microorganisms, when Forest are destroyed Many species lose their habitat.

2) Soil erosion

Trees hold soil Firmly with their roots. When trees are cut, the soil becomes loose & easily washed away by wind or water

3) climate change & Global warming.

Forest absorb Carbon dioxide From the atmosphere. Deforestration increase carbon dioxide levels which leads to global warming and climate change.

4) Desertification

continous removal of Forests can turn Fertile land into dry & baren land.

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5] loss of livelihood
Many tribal and rural communities depends on Forests for Food, fuel & shelter.

Q.7 Explain in breif ecological importance of forest conservations.

1) Conservations of biodiversity.

Forests are home to a large Variety of plants, animals, birds & microorganisms.
Conservation Forests helps protect these species and prevents their extinction.

2) Maintenace of Ecological balance.
Forest Maintain balance between different Component of ecosystems & Help sustain Natural processes.

3) Prevents soil erosion - Trees roots hold soil And reduces land degradation

4) Regulates climate - Forests absorb CO_2 and helps control global warming.

5) Maintain Water cycle - Helps in rainfall & groundwater conservations.

6) Provide habitat for Wildlife - Forests give shelter & Food to many species.

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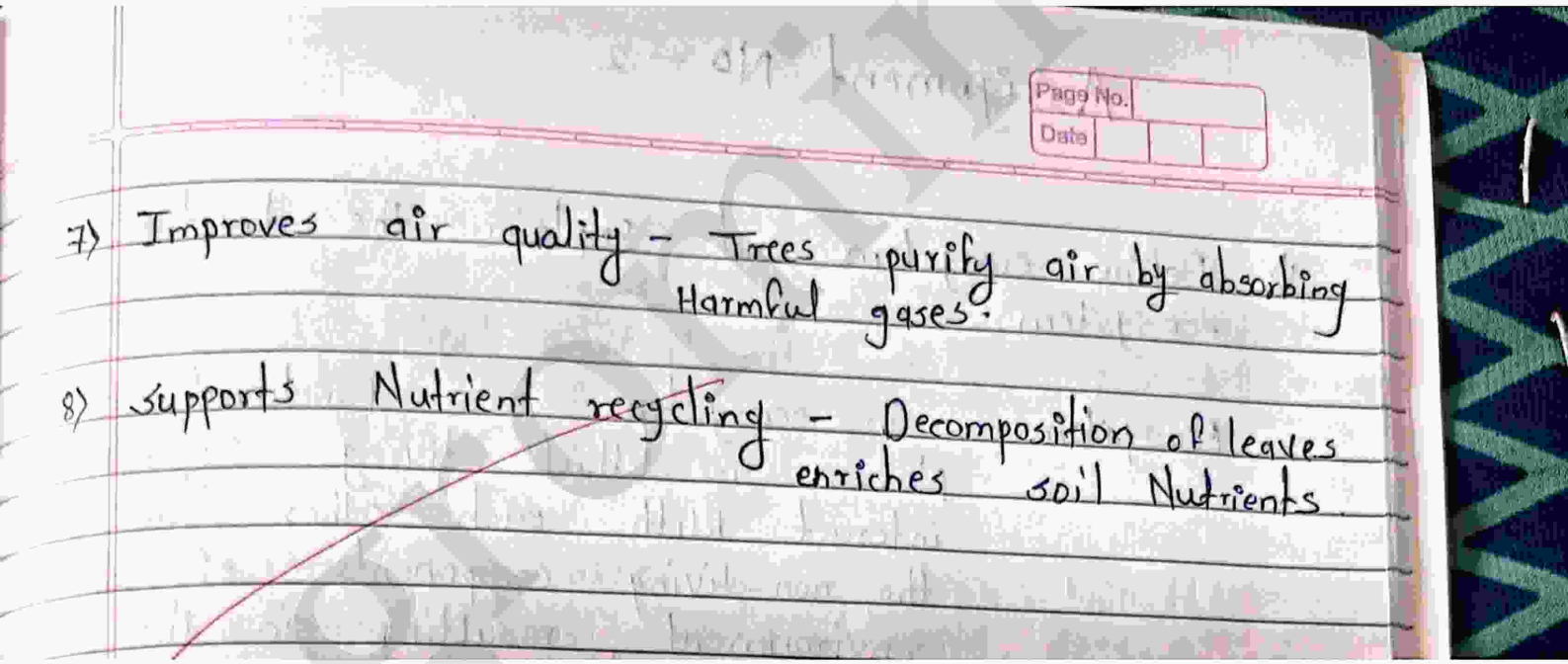
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7) Improves air quality - Trees purify air by absorbing Harmful gases.
8) supports Nutrient recycling - Decomposition of leaves enriches soil Nutrients.

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1) Define ecosystem and Explain the structure of ecosystem

Ecosystem — An ecosystem is a functional units of Nature in which living Organisms interact with each other and with the non-living components of their environment, resulting in the stable system

The structure of an ecosystem refers to the Arrangements & organization of biotic & abiotic components.

1) Abiotic Components
These are the physical and chemical factors of the environments.

a) physical factor
Sunlight, Temperature, Rainfall, Humidity, Wind

b) Edaphic factor
Soil types & Texture, Soil moisture, Soil pH, Mineral content.

c) chemical factor
Water (H_2O), Oxygen (O_2), Carbon dioxide (CO_2), Nutrients (Nitrogen, phosphorous, potassium)

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2. Biotic Components

All living Organisms in the ecosystem are included & divided into :—

a) Producer (Autotrophs) —

- Green plant algae.
- prepared their own Food using photosynthesis
- converts solar energy into chemical energy

Ex., Grass, Crops, trees.

b) Consumers (Heterotrophs)

- Depend on other Organisms for Food.
- primary consumers (Herbivores) Eat plants Ex., Cow, goat, deer.
- Secondary consumers → Ex. Frog, small fish.
- Tertiary consumers → lion, eagle.

c) Decomposers

- Bacteria & Fungi
- Break down dead organic Matter.
- Recycle Nutrient back to the environment.

3. Tropic level

Organism are arranged in differents levels.

producer → Consumer → decompose.

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4. Energy Flow

- Energy enters through sunlight
- Moves from producer to consumer
- Flow in one - way.

5. Nutrient cycling

- Nutrients move between living & non-living components.
- Include cycles like Nitrogen & Carbon cycle.
- Maintains ecosystem balances.

Q.2 Define ecosystem. & Mention in brief about its function -

Ecosystem - The structural and functional system of communities with their environment is called ecosystem.

Function of ecosystem -

1) Production
- plant produced organic matter by photosynthesis
- oxygen is released during the process.
- It is the rate of production of organic Matter by Organisms.

2) Consumption
- Transfer of Material & Transformation of energy From one Tropic level to Another through Process of eating

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- Food is used for growth, Movements & reproductions.

3) Decomposition

: Dead plant and Animals are broken down by micro-organisms.

- Nutrients are returned to the soil for plants uses.

1) Energy flow

Energy flow in one directions from the sun ⟶ producers ⟶ consumer ⟶ decomposer.

Ex:- A lake ecosystem where algae (producers) are eaten by small fish (primary consumer) which are consumed by bigger fish (secondary consumer) & finally, decomposers break down dead fish.

2) Nutrient Recycling

- Circulations of Nutrients between biotic & abiotics Components.

Ex:-) Carbon cycle ⟶ plant take Co_2 & Animal release it.

3) Ecological Regulations

- Controls populations size and species interaction
- Maintain balances in ecosystem.
- prevent Over expolitations of resources.

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Ex..., Removal of predators increase rate. which Damage crops.

Q.3. What is ecosystem & Give the classifications of ecosystems. and Explain in brief the pond ecosystems.

The structural & functional system of community with their environment is called as ecosystem
Ex. grassland, Forest, Pond lake, River & Ocean.

★ classification of ecosystem

A] Natural Ecosystem
Formed Naturally without human infereferences

i) Terrestrial ecosystem (Land)
ex. forest, desert, grassland.

ii) Aquatic ecosystem (Water)
occurs in water bodies.

a) Fresh water ecosystem
Ex., Pond, lake, rivers.

b) Marine ecosystem
Ex.., sea, ocean

B] Artifical ecosystem
Man made & maintain by humans.

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Ex.., Agricultural field, garden.

Pond Ecosystem –

A pond ecosystem is a Freshwater ecosystem that is small, shallow & self sustaining where living organisms interact with Non-living components & maintain a Natural Balance.

Components ——→

a) Abiotic components

- Water
- Sunlight (energy source)
- Dissolved oxygen & CO_2.
- Nutrients like Nitrogen & phosphorus

b) Biotic components (living)

i) producer – Autotrophs that prepared Food by photosynthesis.
Ex. Algae, Aquatic plants.

ii) Consumer – Depend on producer for food.
ex.., zooplankton, Fish, Bird

iii) Decomposer – Bacteria & Fungi

• Food chain in pond
phytoplankton → zooplankton → Fish → Bird

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Functions - supports variety of Organisms.
Helps in Nutrients cycling.
Maintain ecological Balances.

Q.4 Explain in breif grassland ecosystems

A Terristrial ecosystems dominated by grasses with Few scattered trees.

characteristics ⟶

- Moderate rainfall (25-75 cm / year).
- soil rich in Nutrients, supporting large herbivores.

Types of grasslands :-

1. Trophical grassland (savannas)
found a africa, warm climate, seasonal droughts
ex., serengeti (Africa)

2. Temperate grassland (Prairies, steppes)
cooler climate, Few trees, Fertile soil.

Ex., Green plains (USA), Pampas (Argentina)
Animal - Elephant, zebras, Bison, kangaroos.
Importants - supporting grazing animals, agriculture and carbon sequenstrations.

.5 Define Biodiversity. Give its classifications & explain in details about conservations of Biodiversity

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Biodiversity =

Biodiversity refers to the Variety and Variability among all groups of living Organisms and the ecosystems complexes in which they occurs.

Classifications

1) Genetic diversity.
ex. Differents Varieties of mango, rice, wheat

2) species diversity.
ex. Forest ecosystem with Trees, birds, insects.

3) Ecosystem diversity.
Ex.. Forest, grassland, deserts, pond.

Conservation of Biodiversity -

The act or process of conserving. The protection preservation, Managements, or restoratio of wildlifes & of Natural resources such as Forests soils and Water.

Biodiversity conservations is the scientifics Maagements at its optimum level & derive substainables benefits for both the present & the futures.

Approaches of Biodiversity Conservations

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A) In sity Conservation

This is achieved by protections of Wild Flora & Fauna is Natures itselfs.

eg. Biosphere Reserves, National Parks, Sanctuaries, Reserve Forests etc.

Merits → 1) Very cheap & Convenient Methods
2) Adjusted to Natural disaster like dought Floods, Forests, Fires etc.

limitation → 1) large surfaces area is required For preservations.
2) Maintenance is not proper due to shortages of staff & pollutions.
3) Animal cannot survived in Natural environments.
4) Adopted only for few selected species.

Q.6 Define Biodiversity. Describes in details abouts biogeographical Zones of India.

Biodiversity refers to the Variety & Variability amongs all groups of living Organisms & the ecosystem complexes in which They occurs.

Biogeographical Zones -

Major zones representing distinctive units of similar ecology, biome. representation, Community & species.

eg. Himalya Gangetic plain.

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Biogeographic Zones

1) Trans - Himalya - Biotic province - Ladakh & Lahaul spiti (Himachal)

i) Biome - Tundra valley, lakes & marshes
Wildlife - chiru, Black Necked Crane, Himalayan pit viper.

2) Himalaya - Biotic province - North western Himalaya (2a), western Himalaya (2b) central Himalaya (2c), Eastern Himalya (2d).

Biome - all alpine, temperate conifer, Temperate broadleaf, subtropical.
Wildlife - red panda.

3) Indian desert - Biotic province :-
kutchh (3a) Thar (3b)
Biome - salflats, desert grasslands.
Wildlife - blackbuck, flamingo.

4) Semi arid - Biotic province - punjab & Gujrat - Rajwara (4).
Biome - Scrublands, Bhabar forests, hill & thorn Forest.
Wildlife - Tiger, Asian lion

5) Western Ghats - Biotic province - Western Ghats
Wildlife - Lion-tailed macaque, draco.

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6) Deccan peinsula - B.P - Southern plateau (6a), Central plateau (6b) Eastern P(6c), chhola - Nagpur (6d) central Highlands - (6e)

Biome :- Dry deciduous, subtrophicals.
Idildlife - Swamp deer, Mugger.

7) Gangetic plains - B.P - lower & upper Gangetic plains.

Biome - Alluvial plains, rivers.
Idildlife - Rhino, otter, Terrapin

8) Northeast India - B.P - Assam plains (8a), shillong plateau (8b)
Biome - All plain grasslands, Bhabar Terai subtrophical Temperate.

Wildlife pygmy hog, Serow.

9) Islands - B.P - Andaman & Nicobar (9a) Lakshadweep (9b)

Biome - Evergreen, moist deciduous.
Wildlife - Dolphin, Nacrcondam Hornbill.

6) Coasts - B.P - West, coast (10a), East Cost (10b)

Biome - Mangrove, sandy or rocky littoral
Wildlife dugong, sand skink.

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Q.7 Write short Note on

1) Food chain

- The sequence of eating & being eaten in an ecosystem is known as food chain.
- producers (1st trophic level) Green plants prepared their own food by photosynthesis.
- Primary Consumer (2nd trophic level)
  Herbivores (plant-eating animal)
- Secondary Consumer - (3rd trophic level)
  Carnivores that eat Herbivores.
- Tertiary Consumers (4th trophic level) - Top Carnivores Feeding on other Carnivores.

Ex- Grass → Grasshopper → frog → Snake → Hawk

Types of food chain

1) Grazing of food chain
   - Found in grassland, pond ecosystem
   - start with green plants.
   - Ex Grass → Rabbit → Fox

2) Detritus food chain
   - starts with dead organic matters (detritus).

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- Involves decomposers like bacteria & fungi.
- Common in Forest ecosystems.

ii) Food Web

The interlocking pattern of various Food chain is an ecosystem is known as Food Web.
In Food Web many Food chains are interconnected

Differents Types of organisms are connected at a different Trophical levels there is Numbers of opportunities of eating & being eaten at each trophic level.

- The complexity of Any food Web depends upon the diversity of organisms in that ecosystems.
- More complex & stable than a single Food chain.
- Depend on biodiversity of the ecosystems.
- shows multiples pathways of energy flow.

Ex.., Grass is eaten by insects, rats & deer These animals are eaten by Carnivores likes Snakes or tigers.
All these connection togethers Forma a Food Web.

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