1. **Introduction To Environment Science**

**\*Answer the following questions**

* 1. **Define: Environment. Explain the components of environment.**

**Ans-** Definition: “The surroundings or conditions in which an ecosystem exists, is called Environment.”

\*Components of Environment:

The environment is composed of two main categories:

Abiotic (non-living) and Biotic (living) components.

Abiotic Components:

1. Atmosphere:

The layer of gases surrounding the Earth, including nitrogen, oxygen, carbon dioxide, and others.

1. Hydrosphere:

The Earth’s water system, including oceans, lakes, rivers, groundwater, and atmospheric water vapour.

1. Lithosphere:

The Earth’s solid crust, including rocks, soil, and minerals.

1. Climate:

The long-term average atmospheric conditions in a particular region, including temperature, humidity, and precipitation patterns.

1. Light:

The intensity and duration of sunlight, which affects photosynthesis, growth, and development of organisms.

1. Temperature:

The degree of heat or cold in the environment, which affects metabolic rates, growth, and survival of organisms.

Biotic Components:

1. Producers (Autotrophs):

Organisms that produce their own food through photosynthesis.

Eg. plants, algae, and some bacteria.

1. Consumers (Heterotrophs):

Organisms that obtain energy by consuming other organisms or organic matter.

Eg. Animals, fungi, and some bacteria.

1. Decomposers:

Organisms that break down dead organic matter into simpler compounds.

Eg. Bacteria, fungi, and detritivores.

1. Microorganisms:

Small organisms that play crucial roles in decomposition, nutrient cycling, and disease transmission.

Eg. Bacteria, viruses, fungi etc.

These abiotic and biotic components interact and influence each other, creating complex ecosystems that support life on Earth.

* 1. **Explain the layers of atmosphere.**

**Ans-** Here’s an explanation of the layers of the atmosphere:

1. Troposphere

The lowest layer, extending up to 12 km (7.5 miles) above the Earth’s surface. This is where weather occurs, and temperature decreases with altitude.

1. Stratosphere

The next layer, spanning from 12 km to 50 km (7.5 to 31 miles) above the surface. The stratosphere is home to the ozone layer, which protects the Earth from harmful UV radiation. Temperature increases with altitude in this layer.

1. Mesosphere

Extending from 50 km to 85 km (31 to 53 miles) above the surface. Temperature decreases with altitude in this layer, and it’s where meteors burn up.

1. Thermosphere

The fourth layer, ranging from 85 km to 600 km (53 to 373 miles) above the surface. Temperature increases with altitude due to absorption of UV radiation.

1. Exosphere

The outermost layer, extending from 600 km to several thousand kilometers above the surface. This layer interacts with the solar wind and interstellar space.

Each layer plays a crucial role in protecting life on Earth and regulating the planet’s climate.

* 1. **Describe environmental issues and challenges.**

**Ans-**

Environmental Issues

1. Air Pollution:

Polluted air affects our lungs and environment.

1. Water Pollution:

Dirty water harms animals, plants, and humans.

1. Land Degradation:

Destroying forests, soil, and natural habitats.

1. Noise Pollution:

Loud noises disturb humans, animals, and ecosystems.

1. Climate Change:

Global warming causes extreme weather, rising sea levels.

1. Waste Management:

Not managing waste properly harms the environment.

1. Biodiversity Loss:

Losing certain type and amount of plants, animals, and ecosystems.

1. Food Security:

Everyone on this earth is not getting enough food due to wastage.

1. Human Health:

Environmental issues affect our physical and mental well-being.

Effects of Environmental Issues

- Decrease and adversely affect animals and plants

- Damage ecosystems

- Affect human health

- Impact economies

Steps to Reduce Pollutions:

- Reduce, Reuse, Recycle

- Conserve water and energy

- Plant trees and support reforestation

- Reduce noise pollution

- Support renewable energy

- Eat sustainably sourced food

- Protect biodiversity

- Stay informed and advocate for environmental protection

**4) Explain the concepts of ecology and ecosystem.**

**Ans-**

Ecology

Definition:

Ecology is the scientific study of the relationships between living organisms and their environment.

\*Types of Ecology\*

1. Autecology:

The study of the interactions between an individual organism and its environment.

1. Synecology:

The study of the interactions between groups of organisms and their environment.

Here’s the explanation:

Ecosystem

Definition:

“An ecosystem is a community of living organisms (plants, animals, microorganisms) and non-living components (water, air, soil, sunlight) that interact with each other in a specific environment.”

Types of Ecosystems

1. Natural Ecosystems:

Occur naturally, without human intervention.

- \*Terrestrial Ecosystems:

Forests, grasslands, deserts, tundras.

- \*Freshwater Ecosystems:

Rivers, lakes, wetlands.

- \*Marine Ecosystems: Coral reefs, estuaries, open ocean.

2. Artificial Ecosystems

Created and maintained by humans.

- \*Agricultural Ecosystems:

Croplands, orchards, livestock systems

- \*Urban Ecosystems:

Cities, towns, suburbs

- \*Industrial Ecosystems:

Factories, mines, refineries.

**5) Explain the principles and scope in environmental science.**

**Ans-** • **Principles**:

Environmental education considers environment in totality.

It is not a one shot learning process but it requires a holistic approach as it is multidisciplinary in nature

Environmental hazards are controllable and every citizen has a moral obligation and responsibility towards this.

Education must be given to all sections Of the society Promote the value and necessity Of cooperation at personal, local and National level in the prevention of environmental problems and solution for it.

Help learner to discover the systems and causes Of environmental problems

Concerns of environment are concerns of several agencies and everybody should work together.

• **Scope:**

Realizing the importance environmental education the Supreme Court Of India has directed all national organizations like UGC which regulates higher education in India to Offer environmental education as a paper in the curriculum or syllabus Of various degree courses.

Also to increase the awareness among the common people 5th June is celebrated as World Environment Day.

Environmental science is a multidisciplinary science whose basic aspects have a direct relevance to every section Of the society. Its main aspects are:

Conservation of nature and natural resources.

Conservation of biological diversity.

Control Of environmental pollution.

Stabilization of human population and environment