1. Hydrological Cycle

The hydrological cycle is the continuous movement of water in, above or below the surface of the Earth. It begins with the evaporation of water from the surface. Water vapour condenses to form clouds, which causes rain. The rain water may penetrate the surface and go underground where if forms reservoirs, or it may seep into rivers and be carried into oceans.

2. Ozone Layer Depletion Process and Consequences

* Ozone layer serves as a shield from the harmful ultraviolet B radiation emitted by the Sun.
* Ozone is made of three Oxygen atoms bonded together.
* It is produced and destroyed naturally, creating an equilibrium.
* Oxygen molecules absorb ultraviolet radiation to form ozone.
* Free Radicals from CFCs increases rate of ozone depletion.
* Skin cancer, Melanoma, Cataracts, Immune system cannot function properly.
* Aquatic life adversely affected.

3. Acid Rain and its Effects on Living Environment

* Precipitation with a lower pH than natural rainwater.
* Sulphur dioxides and nitrogen oxides from factories and car exhaust
* Emission from volcanoes, decomposing organic waste.
* Water vapour mixes with these pollutants to to form acid rain.
* Damage to plants, animals, aquatic life.
* Damage to metals and buildings.
* Harms human skin, causes respiratory problems, brain damage, Alzheimer’s.
* Humans also affected when they consume food and plants affected by acid rain.
* Increases acidity of soil.

4. SMOG and Other Major Air Pollutants

* Major air pollutants like CO2 and Sulphur dioxide, nitrogen oxide, dust and ground level ozone combine to form SMOG.
* Contributes to global warming, acid rain, greenhouse effect, thinner upper ozone layer.

5. Environmental Justice and Stewardship – Principles of ES

* Environmental stewardship is the efficient use of resources (non-toxic, environment friendly products), reduction of waste to minimize impact on the environment and provision of a healthy (less pollution and noise) and efficient (uses little energy and resources to reduce waste) working environment.
* Environmental justice is the fair treatment of all people, regardless of colour, race or income with respect to development, regulation and policies. Nobody should bear an unfair share of the negative environmental consequences due to government policies. Everyone should have the opportunity to participate in decisions about activities that affect their environment and health. However, most countries are unaware about environmental justice or the mechanisms of addressing the issue.

6. Core Principles of Sustainable Development

* Sustainable development occurs when the present needs are met without future generations having to compromise for it. There are 5 important measures.
* Technology: Use appropriate technology that is eco-friendly, efficient and culturally stable.
* Reduce, Reuse and Recycle: The 3R approach advocates minimization of resource use.
* Promoting Environmental Education and Awareness: This will change the thinking pattern and attitude of people towards the Earth and environment.
* Resource Utilisation per Carrying Capacity: Resources must be utilized so as to not cause environmental degradation.
* Improving Quality of Life: Ensuring the distribution of fair share of benefits.

7. Ecosystem services we get from the environment (not important?)

8. Definition of Environment, Ecology, Biosphere and so on

* Environment - Combination of all external factors or conditions that influence the activities and existence of all living beings including humans.
* Ecology: The relationship between organisms and environment.
* Species: A group of organisms that can breed to produce fully fertile offspring.
* Population: A group of organisms of the same species which live in the same habitat at the same time where they can freely interbreed.
* Biodiversity: The total number of different species in an ecosystem and their relative abundance.
* Ecosystem: A biological community of interacting organisms and their physical environment.
* Biosphere: The regions of the surface and atmosphere of the earth occupied by living organisms.

9. Carrying Capacity of The Environment

Maximum usage limit of an environment or ecosystem without damaging it, from which it can recover.

10. Energy Flow of An Ecosystem

* Sun is the only source of energy.
* Laws of thermodynamics followed.
* Energy can neither be created nor destroyed, only transferred.
* Entropy Law: Transfer of energy leads to loss of energy as heat.
* First Trophic Level: Producers (Green plants)
* Second Trophic Level: Primary Consumers (E.g. Rabbits)
* Third Trophic Level: Secondary Consumers (E.g. Birds, Fishes)
* Fourth Trophic Level: Top Consumers (E.g. Man, Lion)
* Energy reduced by 10% for every flow to higher level.

11. Earth System and Global Atmospheric Change

(Draw a diagram like this)

4 rays of sunlight head towards Earth. 1 is reflected by the atmosphere and 1 is reflected by the surface of Earth. The remaining 2 rays are converted to infrared rays. 1 of these escapes the atmosphere, but the remaining 1 is trapped due to the greenhouse effect, which causes global warming.

Global Temperature may increase upto 4C by end of century at current rate.

12. Uncontrolled Population Growth as an Environment Concern

Population is the total number of human inhabitants of a specified area at a given time. Uncontrolled growth of population can lead to many problems such as pressure on arable land, water, energy and biological resources, overload of Earth’s life support systems, vital resources stressed by demand, groundwater depletion, agricultural soil degradation, overfishing of oceans, oil reserves depletion and deforestation. This leads to starvation, which leads to crime and degradation of living standards.

13. Definition of Weather and Climate

Weather is the atmosphere at a particular time and place. It is a combination of temperature, humidity, precipitation, cloudiness, visibility, wind and atmospheric pressure.

Climate is the overall weather pattern of a specific area over time. It can include seasonal cycles, extreme events, year to year variations.

14. Carbon Sequestration

The more CO2 there is in the air, the better plants grow and the more CO2 they remove from the air and store in leaves, roots, branches and even the soil beneath them. This process is called sequestration and it helps maintain the natural balance.

Answer Format:

Answer 3 sets out of 4 (25 Marks Each)

1. a) …… 05

b) …… 10

c) …… 10

2. a) …… 05

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For 10 Mark Questions:

* Introduction
* Main Argument
* Example
* Conclusion
* Sketches, Diagrams may be included