CLASS ASSIGNMENT

ATTEMPT ALL THE QUESTIONS

1. Discuss what you understand by the following terms:

I. Ecology - Ecology is the study of the relationships between living organisms, including humans, and their physical environment; it seeks to understand the vital connections between plants and animals and the world around them. Ecology also provides information about the benefits of ecosystems and how we can use Earth's resources in ways that leave the environment healthy for future generations. Ecology is a branch of knowledge, and it is not synonymous with environmentalism.

II. Ecosystem - An ecosystem is any geographic area that includes all of the organisms and non-living parts of their physical environment. An ecosystem can be a natural wilderness area, a suburban lake or forest, or a heavily used area such as a city. The more natural an ecosystem is, the more ecosystem services it provides. These include cleansing the water (wetlands and marshes) and air (forests), pollinating crops and other important plants (insects, birds, bats), and absorbing and detoxifying pollutants (soils and plants). The ecosystem is the structural and functional unit of ecology where the living organisms interact with each other and the surrounding environment.

III. Biodiversity - Short for biological diversity, biodiversity is the range of variation found among micro-organisms, plants, fungi, and animals. Some of this variation is found within species, such as differences in shapes and colours of the flowers of a single species of plants. Biodiversity also includes the richness of species of living organisms on earth.

IV. Ecological succession – this is the process by which a community changes over time, especially following a disturbance. In many instances, an ecosystem will change from a simple level of organization with a few dominant pioneer species to an increasingly complex community with many interdependent species. Restoration often consists of initiating,

assisting, or accelerating ecological successional processes, depending on the severity of the disturbance. Following mild to moderate natural and anthropogenic disturbances, restoration in these systems involves hastening natural successional trajectories through careful management.

V. Habitat fragmentation – This describes spatial discontinuities in a biological system, where ecosystems are broken up into smaller parts through land-use changes (e.g., agriculture) and natural disturbance. This both reduces the size of the population and increases the degree of isolation. These smaller and isolated populations are more vulnerable to extinction. Fragmenting ecosystems decreases the quality of the habitat.

2. The structure of an ecosystem is characterized by the organization of both biotic and abiotic components. What do you understand by that?

The biotic and abiotic components are interrelated in an ecosystem. It is an open system where the energy and components can flow throughout the boundaries.

Biotic Components refer to all life in an ecosystem. Based on nutrition, biotic components can be categorised into autotrophs, heterotrophs and saprotrophs (or decomposers) as is further discussed below.

- **Producers** include all autotrophs such as plants. They are called autotrophs as they can produce food through the process of photosynthesis. Consequently, all other organisms higher up on the food chain rely on producers for food.
- **Consumers** or heterotrophs are organisms that depend on other organisms for food. Consumers are further classified into primary consumers, secondary consumers and tertiary consumers.
    - ***Primary consumers*** are always herbivores that they rely on producers for food.
    - ***Secondary consumers*** depend on primary consumers for energy. They can either be a carnivore or an omnivore.

    - ***Tertiary consumers*** are organisms that depend on secondary consumers for food. Tertiary consumers can also be an omnivore.
    - ***Quaternary consumers*** are present in some food chains. These organisms prey on tertiary consumers for energy. Furthermore, they are usually at the top of a food chain as they have no natural predators.
- **Decomposers** include saprophytes such as fungi and bacteria. They directly thrive on the dead and decaying organic matter. Decomposers are essential for the ecosystem as they help in recycling nutrients to be reused by plants.

Abiotic Components are the non-living component of an ecosystem. It includes air, water, soil, minerals, sunlight, temperature, nutrients, wind, altitude, turbidity, etc.