

BT 101 Mid Current Solved

Define Commensalism?

One species gain benefits while those of the other species is neither benefited nor harmed. Example: Remora fish and Sharks

What is aestivation?

Survival in extended period of drying • Avoid temperature damage and dehydration • Examples: Insects, frog, turtle

Major Category of Parasite?

protozoa, helminths, and ectoparasites.

Standard niche?

???

Define ecosystem?

An ecosystem is a community of living organisms in conjunction with the nonliving components of their environment, interacting as a system. These biotic and abiotic components are linked together through nutrient cycles and energy flows.

Sources of nitrogen?

Sources of Nitrogen • Lightning • Inorganic fertilizers • Nitrogen Fixation • Animal Residues • Crop residues • Organic fertilizers

Define Transcription, Percolation and Ground water?

Percolation (Infiltration) • Percolation is an important process. • Rain water soaks into (infiltrates) the ground, into the soil and underlying rock layers. • Some of this water ultimately returns to the surface at springs or in low spots downhill.

Groundwater is the water present beneath Earth's surface in soil pore spaces and in the fractures of rock formations. A unit of rock or an unconsolidated deposit is called an aquifer when it can yield a usable quantity of water.

Transcription

???

Habitat Destruction?

Habitat destruction is the process by which a natural habitat becomes incapable of supporting its native species. In this process, the organisms that previously used the site are displaced or destroyed reducing biodiversity.

Explain the process of coevolution by the example of aphid-ant about co evolution?

Coevolution • Two or more species living in same habitat, reciprocally affect each other's evolution. Ants protect aphids from parasites and predators. • Aphids produce honeydew, source of nutrition for ants. • Specifically coevolved for ants

Define trophic cascade?

- **Species Level** Cascade Subset of the food-web dynamic is impacted by a change in population numbers
- **Community Level** Cascades Change in population numbers has a dramatic effect on the entire foodweb Example: Distribution of plant biomass.

Limit factor that control population?

Limiting factors regulate population size • Rate of Birth • Rate of Death/mortality • Dispersal • Food Resources • Space to grow • Environmental factors

Theory of natural selection who and when?

Darwin influenced by Malthus's ideas, proposed the ground breaking "Theory of natural selection" in 1859.

Water pollution major type?

Surface **Water Pollution**: when harmful substances invade **water** bodies such as oceans, rivers, seas, and lakes. Oxygen Depletion: when too much biodegradable materials promote microorganism growth, and they use almost all oxygen in the **water**.

Camouflage strategies?

1. Crypsis Objects hide and hard to see 2. Mimicry Disguising them as something else 3. Motion dazzle Using visual illusions • Protect without hiding (**Yehi Samjh aayiee**)

What is the effect of population growth and size in term of logistic growth?

What is habitat distribution?

Habitat distribution models (HDMs) predict where suitable **habitat** may exist for a species, based in part on verified observations of the species in their natural environments.

Decomposition?

• Plays important role in nitrogen and carbon cycles.

1. **Autolysis** Breaking down of tissues by the body's own internal chemicals and enzymes

2. **Putrefaction** • Breakdown of tissues by bacteria. • release compounds such as cadaverine and putrescine causing decaying odor

Loss of fragmentation?

Habitat destruction and fragmentation is a process that describes the emergences of discontinuities (**fragmentation**) or the **loss (destruction)** of the environment inhabited by an organism. (**Internet**)

Atmosphere on Earth?

The atmosphere of Earth is the layer of gases, commonly known as air, that surrounds the planet Earth and is retained by Earth's gravity.

Biological clocks?

• Biological Clocks - Diurnal Distribution, sleep-wake cycle - Annual Reproduction, migration

Stratosphere height at equator and pole?

Near the **equator**, the lower edge of the **stratosphere** is as high as 20 km (66,000 ft; 12 mi), around 10 km (33,000 ft; 6.2 mi) at midlatitudes, and at about 7 km (23,000 ft; 4.3 mi) at the **poles**.

Types of grazing?

Types of Grazing 1. **Graminivory** • Feeding primarily on grass • Specifically "true" grasses in family Poaceae Examples: Horses, cattle, hippopotamus, grasshoppers

How mimicry different from camouflage?

The first **difference** is that **mimicry** involves morphological, behavioral, and physiological adaptations, whereas **camouflage** only involves morphological characteristics. Second, in most cases, **camouflage** relates to the blending of the animal or plant with its environment. (**Internet**)

Height of upper and lower layer of mesosphere?

Layer, directly above the stratosphere and directly below the thermosphere • Lower boundary is 50 to 65 kilometres • Upper boundary is around 85 to 100 kilometres • It is called as "near space". (**PPTS**)

The mesosphere is a layer of Earth's atmosphere. The mesosphere is directly above the stratosphere and below the thermosphere. It extends from about 50 to 85 km (31 to 53 miles) above our planet. Temperature decreases with height throughout the mesosphere. (**Internet**)

Habitat fragmentation?

Habitat needs to be an intact body. • Least interference is required to protect niches of organisms. • Many species are too sensitive to tolerate changes in their niches. • e.g. insects

Composition of first atmosphere?

1. First Atmosphere Composition of gases like solar nebula (disc of dirt and gases) Aged 4 billion years ago • Hydrogen • Methane • Helium • Ammonia • Water vapors

Conventional aviation?

Conventional aviation takes place here. • It contains: • 75% of the atmosphere's mass • 99% of the total mass of water vapor and aerosols

Effect of noise?

Effects • Noise pollution can damage physiological and psychological health. • High blood pressure, stress related illness, sleep disruption, hearing loss, and productivity loss • It can also cause memory loss, severe depression, and panic attacks.

Type of air pollution?

The EPA identified six major types of air pollutants deemed especially harmful to human health. These are carbon monoxide, sulfur dioxide, nitrogen oxides, ozone, **particulate matter** and lead. Since the Clean Air Act of 1970 and the identification of these pollutants, air pollution has decreased markedly. **(Internet)**

Primary productivity decomposer?

Fungi • Primary decomposer • Release digestive enzymes by their hyphae • Absorb organic matter and release CO₂

Carbon cycle?

The carbon cycle is the biogeochemical cycle by which carbon is exchanged among the biosphere, pedosphere, geosphere, hydrosphere, and atmosphere of the Earth. Carbon is the main component of biological compounds as well as a major component of many minerals such as limestone. **(Internet)**

Benefit of atmosphere?

The Earth's **atmosphere** protects and sustains the planet's inhabitants by providing warmth and absorbing harmful solar rays. In addition to containing the oxygen and carbon dioxide, which living things need to survive, the **atmosphere** traps the sun's energy and wards off many of the dangers of space. **(Internet)**

Omniverse types?

- **Frugivores**: wolves and orangutans - **Insectivores**: swallows and pink fairy armadillos - **Granivores**: large ground finches and mice

Source of water treatment?

Sources for water purification and for day-to-day use. In general, these resources can be classified as **groundwater** or surface water and commonly include underground aquifers, creeks, streams, rivers, and lakes. **(Internet)**

Secondary waste water?

Secondary treatment is a **treatment** process for **wastewater** (or **sewage**) to achieve a certain degree of **effluent** quality by using a **sewage treatment** plant with physical phase separation to remove settleable solids and a biological process to remove dissolved and suspended organic compounds. **(Internet)**

Mutualism?

Mutualism • Long-term relationship between individuals of different species • Both individuals get benefit Example: Hermit crab and sea anemone

Succession type?

There are two main **types** of **succession**, primary and secondary. Primary **succession** is the series of community changes which occur on an entirely new habitat which has never been colonized before. For example, a newly quarried rock face or sand dunes. **(Internet)**

Name that microorganism that take part in nitrogen fixation?

Two kinds of nitrogen-fixing bacteria are recognized. The first kind, the free-living (nonsymbiotic) bacteria, includes the cyanobacteria (or blue-green algae) *Anabaena* and *Nostoc* and genera such as *Azotobacter*, *Beijerinckia*, and *Clostridium*. **(Internet)**

Name factor that limit population growth? What factor that effect on the rate of growth and size of population?

Limiting factors regulate population size • Rate of Birth • Rate of Death/mortality • Dispersal • Food Resources • Space to grow • Environmental factors. **(PPTS)**

Limiting factors are resources or other **factors** in the environment that can lower the **population growth** rate. **Limiting factors** include a low food supply and lack of space. **Limiting factors** can lower birth rates, **increase** death rates, or lead to emigration. **(Internet)**

Define feeding stage?

Feeding Levels • Food energy passes through different sequence.

- Example: plants → grass hopper → frog → snake → hawk • Many plant species eaten by insects
- Many insects species eaten by frogs

What are the troposphere ozone layer?

The **ozone** in this **layer** of air protects plants, animals, and us by blocking the most harmful rays of the sun. **Tropospheric ozone**, (ground-level **ozone**) is found in the **troposphere**, which is the **layer** of air closest to the Earth's surface. ... **Ozone** does not naturally occur at harmful levels in the **troposphere**. **(Internet)**

What are extensive and major cause?

??????

Sources of land population?

The Main Causes of Land Pollution

- Deforestation.
- Agriculture.
- Industry.
- Mining.
- Landfills and waste.
- Urbanization.
- Other. **(Internet)**

Energy flow in ecosystem?

The cycle of **energy** is based on the **flow** of **energy** through different trophic levels in an **ecosystem**. ... At the first trophic level, primary producers use solar **energy** to produce organic material through photosynthesis. The herbivores at the second trophic level, use the plants as food which gives them **energy**. **(Internet)**

Fundamental of niche?

Fundamental Niche The entire niche that a species is capable of using, based on its physiological tolerance limits and resource needs.

Layer of atmosphere?

Layers of the **atmosphere**. The **atmosphere** is comprised of **layers** based on temperature. These **layers** are the troposphere, stratosphere, mesosphere and thermosphere. A further region at about 500 km above the Earth's surface is called the exosphere. **(Internet)**

Role of autotrophs?

an organism that serves as a primary producer in a food chain. **Autotrophs** obtain energy and nutrients by harnessing sunlight through photosynthesis (photoautotrophs) or, more rarely, obtain chemical energy through oxidation (chemoautotrophs) to make organic substances from inorganic ones. **(Internet)**

Detail note on limiting factor?

A **limiting factor** is a resource or environmental condition which limits the growth, distribution or abundance of an organism or population within an ecosystem. ... A **limiting factor** restricts organisms from occupying their fundamental niche and results instead in the fulfillment of their actual or realized niche. **(Internet)**

Food Web?

- Complexly interconnected food chains in an ecological community • Represent tiny portion of the complexity of real ecosystems.

Foraging?

Foraging is searching for wild food resources. It affects an animal's fitness because it plays an important role in an animal's ability to survive and reproduce. **Foraging** theory is a branch of behavioral ecology that studies the **foraging** behavior of animals in response to the environment where the animal lives. **(Internet)**

Exponential Growth?

Exponential growth is a specific way that a quantity may **increase** over time. It occurs when the instantaneous rate of change (that is, the derivative) of a quantity with respect to time is proportional to the quantity itself. **(Internet)**

Top down effect mean?

Top-Down Effect • Effect flows down through a trophic chain • From apex predator to lower trophic levels

Name 2 effect habitat?

Habitat needs to be an intact body. • Least interference is required to protect niches of organisms. • Many species are too sensitive to tolerate changes in their niches. • e.g. insects

Name of stages of foraging?

• These stages form a foraging Cycle. 1. Search 2. Assessment 3. Capture 4. Handling

Fragmentation on species?

Minor fluctuations in climate, resources, or other factors that would be unremarkable and quickly corrected in large populations can be catastrophic in small, isolated populations. Thus **fragmentation** of habitat is an important cause of **species** extinction. ... Additionally, habitat **fragmentation** leads to edge effects. (Internet)

Sources of wastewater

Wastewater is a byproduct of domestic, industrial, commercial or agricultural activities

Properties are R selected species?

r-selected species • High growth rates • Typically exploit less crowded ecological habitats • Produce many offspring • Relatively low probability of surviving to adulthood. High reproductive rate supports their survival. • Especially in unstable environment

Flow of Energy in Ecosystem Feeding Levels

• Food energy passes through different sequence. • Example: plants → grass hopper → frog → snake → hawk • Many plant species eaten by insects • Many insects species eaten by frogs • this complexity is organized by ecologists. • Recognized limited number of feeding or trophic levels In Food Chain • Food energy passes through different sequence. • Level 1: Primary producer Level 2: Primary consumer Level 3: Secondary consumer Level 4: Tertiary Consumer Level 5: Apex Predator

Role of mine wastewater?

??????

Role of Wisconsin–Madison in restore ecological?

The University of Wisconsin–Madison Arboretum has pioneered restoration ecology. a. The restoration of the prairie was at an early stage in November 1935. b. The prairie as it looks today. This picture was taken at approximately the same location as the 1935 photograph.

Long 5 Marks

Treatment of waste water? Note on treatment of Wastewater

Wastewater treatment is the process of converting **wastewater** – **water** that is no longer needed or is no longer suitable for use – into **bilge water** that can be discharged back into the environment. It's formed by a number of activities including bathing, washing, using the toilet, and rainwater runoff. (Internet)

Stage of Water Cycle? Define stage of Water cycle? Method of Waste water treatment?

There are four main **stages** in the **water cycle**. They are evaporation, condensation, precipitation and collection. Let's look at each of these **stages**. Evaporation: This is when warmth from the sun causes **water** from oceans, lakes, streams, ice and soils to rise into the air and turn into **water** vapour (gas). (Internet)

K and R Species Properties? / Trait of K and R Species? Difference K and R Species?

The two evolutionary "strategies" are termed **r**-selection, for those **species** that produce many "cheap" offspring and live in unstable environments and **K**-selection for those **species** that produce few "expensive" offspring and live in stable environments. (Internet)

Detail note on water pollution?

Water pollution is the **contamination** of **water** bodies, usually as a result of human activities. **Water** bodies include for example lakes, rivers, oceans, aquifers and groundwater. ... For example, releasing inadequately treated wastewater into natural **water** bodies can lead to degradation of aquatic ecosystems. (Internet)

Global Warming? Effect of Global Warming?

Global warming is the long-term rise in the average temperature of the Earth's climate system. It is a major aspect of climate change, and has been demonstrated by direct temperature measurements and by measurements of various effects of the warming. Global warming and climate change are often used interchangeably.

Consumer Resources?

Consumer-Resource system • Direct or indirect balance between resources and consumption • Predators indirectly increase plant growth. • They prevent overgrazing by suppressing herbivores. • The net effect of direct and indirect relations is called trophic cascades.

What are consumer ecosystem?

Consumer is a category that belongs within the food chain of an **ecosystem**. It refers predominantly to animals. **Consumers** are unable to make their own energy, and instead rely on the consumption and digestion of producers or other **consumers**, or both, to survive. **(Internet)**

Invasion species?

Colonization, a natural process by which a species expands its geographic range, occurs in many ways. Examples: • Seed dispersal by birds • Lowering of sea levels join two isolated land masses • Flooding
Types of invasive species 1. Animals 2. Plants 3. Pathogens • They cause an imbalance in the natural environment. • They outcompete the native species.

Feeding in food chain?

The fundamental purpose of **food webs** is to describe **feeding** relationship among species in a community. ... The second trophic level consists of herbivores. These are first consumers. The remaining trophic levels include carnivores that consume animals at trophic levels below them. **(Internet)**

Aposematism?

Aposematism is the advertising by an animal to potential predators that it is not worth attacking or eating. This unprofitability may consist of any defences which make the prey difficult to kill and eat, such as toxicity, venom, foul taste or smell, sharp spines, or aggressive nature.

Acid Rain?

Acid rain is a **rain** or any other form of precipitation that is unusually **acidic**, meaning that it has elevated levels of hydrogen ions (low pH). ... **Acid rain** is caused by emissions of sulfur dioxide and nitrogen oxide, which react with the water molecules in the atmosphere to produce **acids**. **(Internet)**

Primary and Secondary treatment of wastewater?

Primary treatment consists of temporarily holding the **sewage** in a quiescent basin where heavy solids can settle to the bottom while oil, grease and lighter solids float to the surface. The settled and floating materials are removed and the remaining liquid may be discharged or subjected to secondary **treatment**. **(Internet)**

Secondary treatment is a **treatment** process for **wastewater** (or **sewage**) to achieve a certain degree of effluent quality by using a **sewage treatment** plant with physical phase separation to remove settleable solids and a biological process to remove dissolved and suspended organic compounds. **(Internet)**

Feeding strategies?

• Different feeding strategies Major strategies: 1. Grazers 2. Browsers

1. Grazers • Feeds on plants such as grasses, soft flowering plants (forbs) and algae • Plants are not killed. • Examples: Deer & Snails

Types of Grazing 1. Graminivory • Feeding primarily on grass • Specifically "true" grasses in family Poaceae Examples: Horses, cattle, hippopotamus, grasshoppers

2. Browsers • Feed on non-grass plant material • Leaves, soft shoots, twigs, fruits, woody plants such as shrubs Examples: Goats, deer, giraffe, elephants

Over browsing - Introduction of herbivores - Low productivity of native plants - Less predation pressure

Ozone depleting substance?

Ozone Depleting Substances

- Halocarbon refrigerants
- Solvents

- Propellants in aerosols
- Chlorofluorocarbons
- Hydro chlorofluorocarbons
- Methyl bromide
- Carbon tetrachloride
- Methyl chloroform

Logistic growth?

Logistic Population Growth • Carrying capacity of environment affect population growth. • Environmental resistance • Growth rate gets smaller as approaches the carrying capacity
Environmental factors affect population growth. • Climate • Food • Space • Competition.

Light pollution and its environmental effect?

Light pollution, also known as photo pollution • Excessive, misdirected or obtrusive artificial light • Major side-effect of urbanization • It is blamed for compromising health, disrupting ecosystems and spoiling aesthetic environments.

Effects Animals • Negative impacts on plant and animal physiology • Sleep • Foraging behavior • Predation • Reproduction • Animal navigation • Alter competitive interactions • Change predator-prey relations

Types of Parasites?

Types of Parasites

1. Microparasites: reproduce inside host Bacteria, viruses
2. Macroparasites: release juvenile outside host E.g. trematodes
3. Endo parasites Examples: Liver fluke, tape worm, nematodes
4. Ectoparasites Examples: Ticks, mites, fleas, mosquito, lice

Difference between Waste water treatment and Primary Secondary treatment?

Wastewater treatment is the process of converting **wastewater** – **water** that is no longer needed or is no longer suitable for use – into **bilge water** that can be discharged back into the environment. It's formed by a number of activities including bathing, washing, using the toilet, and rainwater runoff. **(Internet)**

Primary treatment consists of temporarily holding the **sewage** in a quiescent basin where heavy solids can settle to the bottom while oil, grease and lighter solids float to the surface. The settled and floating materials are removed and the remaining liquid may be discharged or subjected to secondary **treatment**. **(Internet)**

Secondary treatment is a **treatment** process for **wastewater** (or **sewage**) to achieve a certain degree of effluent quality by using a **sewage treatment** plant with physical phase separation to remove settle able solids and a biological process to remove dissolved and suspended organic compounds. **(Internet)**