

BT101- MID TERM (CURRENT PAPER SOLUTION)

Q. Define Omnivores with 3 examples?/2

Animals that feeds on both herbivores and carnivores.

Examples:- Humans pigs, foxes, cockroaches, common carp and tilapia.

Q. Define electromagnetic radiation and its 2 types?/2

Electromagnetic radiations:

A form of kinetic energy, in which energy travels in the form of a wave as a result of changes in electric and magnetic fields.

Types

1. Electromagnetic radiations with short wavelength
2. Electromagnetic radiations with long wavelength

Q. How to analyze soil? /3

Soil analysis is a set of various chemical processes that determine the amount of available plant nutrients in the soil, but also the chemical, physical and biological soil properties important for plant nutrition, or "soil health". Chemical soil analysis determines the content of basic plant nutrients; nitrogen (N), phosphorus (P₂O₅), potassium (K₂O), pH, humus content, total CaCO₃, available lime, organic matter, total sulphur (S), trace elements, and other physical characteristics (capacity, permeability, density, pH - value)

Q. Differentiate btw keystone and foundation species with examples. /3

A foundation species creates or provide a foundation of an ecosystem. Examples are Elephant, Beavers some birds and bats.

keystone species regulates and maintains that ecosystem Examples are the alligator, wolf, leopard, lion, & some shark species

Q. Difference btw Population and Metapopulation. /2

Population: A group of same species located at the same place and same time is called as a population

Metapopulation: A group of populations of same species which are separated by space. Individuals can move from one population to other

Q. What kind of factors are important in population dynamics? 2 marks

Factors regulating population, ☐ Birth rate ☐ Death rate ☐ Food ☐ Climate ☐ Water ☐ Competition ☐ Predators ☐ Emigration ☐ Immigration ☐ Disease

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Q. Which species are better specialist or generalist? 3 marks

It depends on environmental conditions. When environmental conditions are fairly constant, as in a tropical rain forest, specialists have an advantage because they have fewer competitors. But under rapidly changing environmental conditions, the generalist usually is better off than the specialist. China's giant panda is highly endangered because of a combination of habitat loss, low birth rate, and its specialized diet consisting mostly of bamboo.

Q. Write 3 types of Electromagnetic Radiations /3

Electromagnetic radiations with short wavelength

- 1) Gamma rays 2) X rays 3) (UV) ultraviolet radiation

2. Electromagnetic radiations with long wavelength

- 1) Visible light 2) Infrared radiation (IR)

Q. Define ecological pyramid?/2

An ecological pyramid is a graphical representation designed to show the biomass or bio productivity at each trophic level in a given ecosystem.

Q. Define the following terms

Plankton: A microscopic swimming and free floating organisms in water are termed as planktons.

Phytoplankton Microscopic organisms that float or drift in the water. Phytoplankton, a great source of food for a wide range of aquatic creatures including whales, shrimp, snails, and jellyfish.

Zooplankton: A microscopic drifting animals are known as zooplankton.

Ultraplankton: A very small drifting plankton having size less than 2 micrometer are called as ultraplancton.

Q. write population properties which are use to study it?

Every population has particular characteristics:

- ☐ Population size ☐ Population growth ☐ Population distribution ☐ Population density

Q. list some organism of inland wetland area?

Some examples of inland wetlands are ☐ Marshes ☐ Swamps ☐ Prairie potholes ☐ Floodplains

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Q. What are red tides (2)

Red tide the harmful and toxic blooms of red Dinoflagellates cause the colour of sea water to become red.

Q. factors affecting stream flow (3)

The velocity of a stream depends on following factors i. Volume of water ii. Stream channel width and depth iii. Slope or gradient of stream

Q. Subfields of ecology (3)

Sub fields of ecology ☐ Organismal ecology ☐ Population ecology ☐ Community ecology ☐ Ecosystem ecology ☐ Landscape ecology ☐ Global ecology

Q: Describe photosynthesis.2 marks

Photosynthesis: Photosynthesis is the vital process by which producers manufacture food for organisms in an ecosystem. Plants get Carbon dioxide from air and absorb water from soil get sunlight due to chlorophyll and synthesize glucose with oxygen by product.

Q. Hotspot species.2marks

Species hotspots: Species hotspots are geographic regions that support high level of species diversity

Q. Difference btw filter feeders and deposit feeders (3)

Deposit feeders: some of organisms found in deep ocean are deposit feeders. These organisms take mud into their guts & extract nutrients from it. Some worm's species are deposit feeders. While Other organisms found in deep oceans are filter feeders. They take in large amount of water into the body and then filter nutrients from it. Organisms like oysters, clams, and sponges are filter feeders

Q. Define Specialist species (2)

Specialist species: Those species that occupy narrow range of niches are known as specialist species

Q. Define Generalist species

Generalist species those species that have broad range of niches are known as generalist species. They can live in many different places, eat a variety of foods, and often tolerate a wide range of environmental conditions.

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Q. Describe the process of endotherm animals in hot and cold weather (3)

Endotherm organisms are warm blooded animals so their body temperature remains constant.

Survival mechanisms in hot environment: o Sweating o Panting o Vasodilation o Aestivation

Survival mechanisms in cold environment: o Fat deposits o Fur o Feathers o Vasoconstriction o Hibernation

Q. Enlist the components of ecology (3)

Major components of ecology are ☐Species ☐Population ☐Community ☐Ecosystem ☐Biome ☐Biosphere

Q. Define trophic levels with example. 2

The highest level an organism occupies on a food chain is termed as trophic level. Example the producers that lies at bottom in food pyramid is example of trophic level.

Q. Define Torpor give example /2

Torpor: A condition in which the rate of metabolism, circulation and respiration of individuals decreases when they are not feeding Example Bat and Hummingbird

Q. Role of ecological and mechanical forces in land plants

Terrestrial plants are self supportive plants, so they are strong and stiff in nature. They experience Gravity as a main environmental force while Wind as an external mechanical force.

Q. Explain types of ecological pyramids /3

1. Pyramid of number It represents the number of individuals at each trophic level of an ecosystem. More number of individuals at base while a gradual decrease in number towards top of pyramid.

2. Pyramid of biomass It indicates mass of living matter at each trophic level of food chain. High biomass at the base while lower at top of the pyramid.

3. Pyramid of energy Determines the flow of energy through each trophic level in a food chain.

Q. Write some computation of organism by their life cycle. /2

Amphibians (frogs, toads, and salamanders) live part of their lives in water and part on land usually they lay eggs in water and spend early life in water having metamorphosis changes.. larva>>tadpole>>frog

Q. Explain some chemical function of plants /3

Plant cells have a number of organelles that perform functions such as storing food, processing waste, fixing and releasing chemical energy, and copying their genetic material

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Q. Write 3 reasons that decrease the size of population?/3

Organisms will also die of old age and the population will decrease. Populations can also decrease when there are more predators around, after a natural disaster, when competition is too great or when some of the organisms just leave the area (migration)

Q. Define Detritivores with examples /3

Detritus feeders, or detritivores, feed on the wastes or dead bodies of other organisms, which is called as detritus. Examples: Small organisms such as Mites Earthworms Some insects Catfish Larger scavenger organisms Vultures.

Q. Define Aestivation?/2

Aestivation or summer sleep is a period of inactivity & low metabolic rate in animals in response to high temperature & dry season. Aestivation is common in many invertebrates, reptiles, & amphibians.

Q. Define tertiary consumers with 3 example/ 2

Tertiary consumers are carnivores that feed on the flesh of other carnivores. Tigers, wolves, mice-eating snakes, hawks, and killer whales.

Q. What is the role of wind action in lentic water bodies. 2

Wind action is very vital in these water bodies because it increases the content of dissolved oxygen that is necessary for the aquatic life in these water bodies.

Q. Types of organisms on the bases of types of food consumption 3

There are four types of organisms on the bases of food consumption 1) Primary consumers 2) secondary consumers 3) tertiary consumers and quaternary consumers

Q. What kind of factors are used to determine species of a community /3

1) Species composition 2) Species richness 3) Species diversity and dominance are the factors used to determine species of a community

Q. Write the names of 3 zones of river /3

☐ Source zone ☐ Transition zone ☐ Floodplain zone

Q. Enlist the main components that support life on earth./3

Earth's life-support system consists of four main spherical systems that interact with one another. 1. The atmosphere (air) 2. The hydrosphere (water) 3. The geosphere (rock, soil, sediment) 4. The bio

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Q. Enlist 3 specific sites where recovery succession occurs. 3

1. Development of an ecosystem.
2. Sustainability of ecosystem.
3. Recovery of ecosystem from damage caused by humans or any other natural disaster.
4. Balance of nature.

Q. Define Logistic population growth. 2marks

Decrease in growth of rapidly growing populations due to limited resources, until they reach their carrying capacity is termed as logistic population growth

Q. Enlist at least three specific sites of secondary succession occur?

Secondary succession include 1) Abandoned farmland 2) Burned or cut forests 3) Heavily polluted streams 4) Flooded lands

Q. Define species and enlist the primary concepts that define species?/2

Species: A group of sexually reproducing organisms that can mate and produce fertile offspring. This is the biological concept of species

Q. Define ecosystem writes its different Types of ecosystem

An ecosystem is a community of different species interacting with one another and with their nonliving environment of soil, water, other forms of matter, and energy, mostly from the sun. Ecosystems can be natural or artificial (human created). Examples of artificial ecosystems are crop fields, tree farms

Q. Write Name of key stone species and indicator species

Keystone species: the alligator, wolf, leopard, lion, & some shark species

Indicator species: Trout fish indicates water quality, Caged canaries(songbirds) detect early warning in mines. Some birds and amphibians are example of indicator species

Q. Write the Impact of non-native species

Impact of non-native species:

- Non-native species can spread rapidly if they find a new more favourable niche.
- In their new niches, these species often do not face the predators and diseases they faced before.
- They may be able to out-compete some native species in their new niches.
- Causes habitat loss and ecosystem disturbance

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Q. What is HABs?

Too much nutrients causes Harmful Algal Blooms (HABs) which are extremely toxic to living creature

Q. Write types of fresh water bodies.

Freshwater ecosystem: Freshwater Division Freshwater ecosystem includes

1. Lentic water bodies or systems
2. Lotic water bodies or systems

Q. Difference between hibernation and winter sleep.

True hibernation occurs in small animals in which temperature substantially falls to remain alive in cold environment. Animals remain inactive for weeks or even for months.

Hibernation in large animals like bears is termed as winter sleep. Body temperature does not falls substantially and sleeping animals can wake and active quickly. It lasts for short period of time. Large animals have more energy reserves that enables them to survive in winter.

Q. Differentiate between Autogenic and Allogeneic succession. /3

Autogenic succession: In autogenic succession the successional process is controlled by living or biotic component of an ecosystem

Allogenic succession: The entire successional process is controlled by non living or abiotic components of ecosystem.

Q. Define food pyramid? /2

A food pyramid is a graphical representation of flow of energy through different trophic levels of an ecosystem

Q. population dispersion /3

General patterns of population distribution or dispersion 1. Clumping 2. Uniform dispersion 3. Random dispersion

1. Clumping Individuals are found in form of groups or clusters due to uneven distribution of resources.
2. Uniform dispersion: The tendency for populations to be found evenly distributed about their habitat. This is generally caused by a species ability to survive anywhere in their habitat. They use the resources found immediately around them, & spread out as to use all of the available resources.
3. Random dispersion Distribution of populations in a random fashion through out their habitat. Generally randomly distributed populations are rare while clumped distribution is common.

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Q. Difference between aquatic and terrestrial biomes??

Terrestrial plants are self supportive plants, so they are strong and stiff in nature. They experience Gravity as a main environmental force while Wind as an external mechanical force.

Organisms that manufacture food in aquatic environment. In freshwater and marine ecosystems, algae and aquatic plants are the major producers. In open water, the dominant producers are phytoplankton.

Q. Define permafrost?

polar ice, icebergs, & ice in frozen soil layers called permafrost

Q. Define cell theory?

Cell is the basic structural and functional unit of life. All organisms are composed of cells which is the basic concept of cell theory. Organisms may consist of single cell (unicellular) or many cells (multicellular).

Q. write three properties of Ectotherms(Exotherm)?

Characteristics of Ectotherms:

- ☐ Low metabolic rate
- ☐ Generate body heat from external environment
- ☐ Body insulation is very poor

LONG QUESTIONS

Q. Write Importance of coral reefs? 5 marks

Importance of coral reefs:

- ☐ Provide natural habitat
- ☐ Economic benefits
- ☐ Food
- ☐ Medicine
- ☐ Recreation
- ☐ Breeding grounds
- ☐ Nursing grounds

Q. what is carrying capacity and which factors effect it/5

Carrying capacity (K) The maximum population of a given species that a particular habitat can sustain without being degraded. The carrying capacity of an area or volume is not fixed. Carrying capacity:

Factors that influence carrying capacity are, oFood availability oWater oSpace oEnvironmental conditions
The growth rate of a population decreases as its size comes near the carrying capacity of its environment because resources such as food, water, and space begin to decrease. A drought can decrease the amount of vegetation growing in an area supporting deer & other herbivores, & this would decrease the normal carrying capacity for those species.

Carrying capacity plays a vital role in sustainability and protection of an environment. when a population exceeds the carrying capacity of an area, it causes damage that reduces the area's carrying capacity

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Explain types of energy quality(5)

Energy quality: It determines the ability of an energy source to do useful work. Energy manifest itself in several forms such as heat, mechanical, electrical, magnetic, kinetic (in motion), potential, etc. Some types of energy are more useful than the others. Two types of energy on the base of energy Quality, 1. High quality energy 2. Low quality energy

High quality energy: High-quality energy is concentrated form of energy and has a high capacity to do useful work. Examples are, ☐ Very high-temperature heat ☐ Nuclear fission ☐ Concentrated sunlight ☐ High-velocity wind ☐ Energy released by burning natural gas, gasoline, or coal.

Low quality energy: A dispersed form of energy that has a little capacity to do useful work. Heat energy of moving water molecules is of low quality because it is dispersed in water molecules that lowers its temperature.

The total amount of heat stored in the Atlantic ocean is greater than the amount of high quality chemical energy stored in all the oil deposits of Saudi Arabia. But wide dispersion of this ocean's heat energy makes it unable to do useful work.

Q. Explain indicator species with three examples (5)

Indicator species: Species that provide early warnings of damage to a community or an ecosystem are called indicator species. For example, the presence or absence of trout species in water at temperatures within their range of tolerance is an indicator of water quality because trout need clean water with high levels of dissolved oxygen.

Birds are excellent biological indicators because they are found almost everywhere and are affected quickly by environmental changes such as loss or fragmentation of their habitats and introduction of chemical pesticides. The populations of many bird species are declining.

Butterflies are also good indicator species because their association with various plant species makes them vulnerable to habitat loss and fragmentation. During early 1900s, coal miners took caged canaries (songbirds) into mines to detect early-warning signals. These birds sing loudly and often. If they quit singing for a long period and appeared to be distressed, miners took this as an indicator of the presence of poisonous or explosive gases and got out of the mine. Some amphibians are also classified as indicator Species. Amphibians (frogs, toads, and salamanders) live part of their lives in water and part on land. Populations of various frog species can decline because of the effects of harmful factors at different points in their life cycle.

Such factors include habitat loss, drought, pollution, increased ultraviolet radiation, parasitism, disease, overhunting by humans, & non native predators & competitors.

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Q. Write a note on ecosystem? 5 marks

Ecosystem: The word ecosystem was coined by Tansley in 1935. An ecosystem is a community of different species interacting with one another and with their nonliving environment of soil, water, other forms of matter, and energy, mostly from the sun. Ecosystems can be natural or artificial (human created). Examples of artificial ecosystems are crop fields, tree farms, and reservoirs. Ecosystems do not have clear boundaries and are not isolated from one another. Matter and energy move from one ecosystem to another.

For example, soil can wash from a grassland or crop field into a nearby river or lake. Water flows from forests into nearby rivers and crop fields. Birds and various other species migrate from one ecosystem to another. Winds can blow pollen from a forest into a grassland. Ecosystem is a basic structural and functional unit of ecology. Structure of an ecosystem depends on species diversity as well as the energy that is required to maintain it.

If there is more species diversity then structure of ecosystem will be more complex and less energy will be needed to maintain the structure of ecosystem.

An ecosystem consists of two major components

1. Biotic components
2. Abiotic components

The interactions between both these components constitutes an ecosystem. Biotic components Living components of an ecosystem

1. Producers : Green plants
2. Consumers: Animals
3. Decomposers: Bacteria and fungi

Abiotic components: Non living components of an ecosystem Physical components:

1. Water
 2. light
 3. Temperature
 4. Wind
 5. Air
 6. soil
- Chemical components: 1. Oxygen 2. Carbon 3. Nitrogen 4. Phosphorus 5. Sulphur.

Q4: Survivorship curves. 5 marks

Survivorship curves are a plot of number of survivors (usually a logarithmic plot) versus age. Type I curves apply to populations in which individuals are likely to live out their potential life span. Type II curves apply to populations in which mortality rates are constant throughout age classes. Type III curves apply to populations in which mortality rates are highest for the youngest cohorts (Group of individuals having same characters)

Q5: Enlist use of light 5 marks.

Light plays a vital role in following life running processes: o Seed germination o Transpiration o Photoperiodism o Growth o Reproduction o Modification in leaf structures o Migration o Communication

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Q. Define keystone organism and enlist three example (5)

Keystone species: Some species play a key and crucial role in maintaining the structure of a biological community. They are called Keystone species because they have a large effect on the types and abundances of other species in an ecosystem.

The effects that keystone species have in their ecosystems is often much larger than their numbers and because of their relatively limited numbers, some keystone species are more vulnerable to extinction than others.

Keystone species can play several critical roles in helping to sustain an ecosystem. One such role is pollination of flowering plant species by bees, butterflies, hummingbirds, bats, and other species. The monarch butterfly, which feeds on pollen in a flower and other insects pollinate flowering plants that serve as food for many plant eaters.

In addition, top predator keystone species feed on and help regulate the populations of other species. e.g; are the alligator, wolf, leopard, lion, & some shark species.

Sharks are also a keystone species because they remove injured and sick animals from the ocean, and thus play an important ecological role. Without the services provided by these keystone species, the oceans would be filled with dead & dying fish. The loss of a keystone species can lead to population crashes and extinctions of other species in a community that depends on it for certain services. This explains why it so important for scientists to identify and protect keystone species

Define following./5

Habitat:- Actual place of an organism where it lives is called its habitat or environment

range,;- Animals always live within a certain range of values, called the tolerance range, for any environmental factor. At either limit of the tolerance range, one or more essential functions cease.

Optimum range :- Range of optimum defines the conditions at which organisms are most successful in survival. Organisms can performed their life activities well under these optimum conditions.

A certain range of values within the tolerance range is called the range of optimum

Limiting factor :- Limiting factor When an abiotic factor becomes out of an organism tolerance range then it is said to be a limiting factor. For example oOxygen oWater oFood

Q. Define atmosphere and it's role in ecosystem 5

1) Atmosphere

The atmosphere is a mixture of nitrogen (78%), oxygen (21%), and other gases (1%) of the air includes water vapor, carbon dioxide, and methane, all of which are called greenhouse gases, because they trap heat and thus warm the lower atmosphere. High above the planet, the atmosphere becomes thinner until it gradually reaches space. It is divided into five layers. Most of the weather and clouds are found in the first layer. The

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atmosphere is an important part of what makes Earth livable. It blocks some of the Sun's dangerous rays from reaching Earth. It traps heat, making Earth a comfortable temperature. And the oxygen within our atmosphere is essential for life

Q. Define cultural eutrophication Write characteristics of eutrophic lake.5Marks

Cultural eutrophication

Human inputs of nutrients from the atmosphere and from nearby urban and agricultural areas can enhance the biological activity of lakes by a process called cultural eutrophication.

Characteristics:-

1) Shallow depth 2) Murky brown or green water 3) High turbidity 4) High net primary productivity
Eutrophic lake: Eutrophic lake usually have o Shallow depth o Murky brown or green water o High turbidity o High net primary productivity.

Hypertrophic lake:- Lake having excessive amounts of dissolved nutrients.

Mesotrophic lake A lake having moderate amounts of dissolved nutrients. A eutrophic lake having an excess of plant nutrients. Its surface is covered with mats of algae and cyanobacteria

Q. Explain 3 zones of River /5

Source zone: Source zone containing mountain (headwater) streams. Headwaters are often small streams with cool waters because of shade and recently melted ice or snow. They may also be glacial headwaters, waters formed by the melting of glacial ice. Headwater areas are the upstream areas of a watershed, as opposed to the outflow or discharge of a watershed. The river source is often but not always on or quite near the edge of the watershed, or watershed divide.

Transition zone: – Transition zone containing wider, lower-elevation streams.

Floodplain zone: – Floodplain zone containing rivers, which empty into the ocean.

Q. Write short note on Soil horizon?

O-horizon

This layer generally forms above the mineral soil or occurs in an organic soil profile. The "O" stands for organic matter. It is a surface layer dominated by the presence of large amounts of organic material derived from dead plant and/or animal residues which is in varying stages of decomposition. The O horizon is generally absent in grassland regions. The O horizon usually occurs in forested areas and is commonly referred to as the forest floor. The O horizon is a surface horizon that is comprised of organic material at various stages of decomposition. It is most prominent in forested areas where there is the accumulation of debris fallen from trees.

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A-horizon

The A horizon is the topmost mineral horizon, often referred to as the 'topsoil'. This layer generally contains enough partially decomposed (humified) organic matter to give the soil a color darker than that of the lower horizons. The A horizons are often coarser in texture, having lost some of the finer materials by translocation to lower horizons and by erosion. The A horizon is a surface horizon that largely consists of minerals (sand, silt, and clay) and with appreciable amounts of organic matter. This horizon is predominantly the surface layer of many soils in grasslands and agricultural lands.

B-horizon

B horizons form below an O, A horizon and they have undergone sufficient changes during soil genesis, such that the properties of their original parent material are no longer discernible. The B horizon is commonly referred to as the "subsoil". In humid regions, B horizons are the layers of maximum accumulation of materials such as silicate clays, iron (Fe) and aluminum (Al) oxides, and organic material.

C-horizon

The C horizon (parent material) is below the B Horizon. This layer is little affected by soilforming processes and they thus have a lack of pedological development. In other words, the C horizon is the unconsolidated material underlying the solum (A and B horizons). It may or may not be the same as the parent material from which the solum formed. The C horizon forms as the R horizon weathers and rocks break up into smaller particles. The C horizon is a subsurface horizon. It is the least weathered horizon. Also known as the saprolite, it is unconsolidated, loose parent material.

Q. Explain Mechanism of survival of endothermic cold and hot environment?

Mechanisms

Generating and conserving heat: Many endotherms have a larger number of mitochondria per cell than ectotherms. This enables them to generate heat by increasing the rate at which they metabolize fats and sugars. Accordingly, to sustain their higher metabolism, endothermic animals typically require several times as much food as ectothermic animals do, and usually require a more sustained supply of metabolic fuel. In many endothermic animals, a controlled temporary state of hypothermia conserves energy by permitting the body temperature to drop nearly to ambient levels. Such states may be brief, regular circadian cycles called torpor, or they might occur in much longer, even seasonal, cycles called hibernation. The body temperatures of many small birds (e.g. hummingbirds) and small mammals (e.g. tenrecs) fall dramatically during daily inactivity, such as nightly in diurnal animals or during the day in nocturnal animals, thus reducing the energy cost of maintaining body temperature.

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Q. Explain Species Diversity /5

Species diversity refers to the measure of diversity in an ecological community. Species diversity takes into consideration species richness, which is the total number of different species in a community. It also takes into account evenness, which is the variation of abundance in individuals per species in a community.

Communities with more species are considered more diverse than those with fewer. A community with less variation in the relative abundance of individuals per species is considered more even than one with more variation. Communities that are more even are also said to be more diverse. Several mathematical equations exist that incorporate evenness and abundance to measure species diversity

Q. Define sustained and its feed backs /5

How Living systems are sustained: All living systems from a cell to the biosphere are dynamic systems that are constantly changing in response to changing environmental conditions. The composition of communities and ecosystems changes due to ☐ Continents movement ☐ Climate changes ☐ Natural disturbances ☐ Succession

Living systems contain complex networks of positive and negative feedback loops that interact to provide some degree of stability, or sustainability, over each system's expected life span. This stability, or capacity to withstand external stress and disturbance, is maintained only by constant change in response to changing environmental conditions.

A negative, or corrective, feedback loop causes a system to change in the opposite direction from which it is moving. A simple example is a thermostat, a device that controls how often, & how long a heating or cooling system runs.

A positive feedback loop causes a system to change further in the same direction from which it is moving. For example when vegetation is removed from a stream valley, flowing water from precipitation causes erosion and loss of nutrients, which causes more vegetation to die. With even less vegetation to hold soil in place, flowing water causes even more erosion and nutrient loss, which causes even more plants to die. It is useful to distinguish among two aspects of stability in living systems.

1. Inertia, or persistence 2. Resilience

Inertia, or persistence The ability of a living system, such as a grassland or a forest, to survive in conditions of moderate disturbances.

Resilience The ability of a living system to be restored through secondary succession after a moderate disturbance.

Q. What is the reproductive potential? Which factors effect it /5 marks.

Reproductive potential Ability of individuals to reproduce under ideal or optimum conditions. Exponential growth cannot occur indefinitely.

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Factors influencing reproductive potential ☐ Number of offspring produced ☐ The likelihood of survival to reproductive age ☐ Duration of the reproductive period ☐ Length of time it takes to reach maturity

Q. How can we use species composition as an indicator of environment 5 marks

Species composition: Species composition is all the different living organisms that develop or compose a community within an ecosystem. Species composition is an important tool for the determination of community structure of a specific place. Study of species composition tells us how an ecosystem works as well as the importance of each species in that ecosystem. It is expressed as a percent. Species composition can be expressed on either an individual species basis, or by species groups.

It is used as an important indicator for analyzing ecological & management processes occurring at a particular site. Species composition can be used as an indicator by two ways,

- ☐ Ecological indicators
- ☐ Management indicators

Ecological indicators: Species composition is used as an ecological indicator to evaluate natural biodiversity & to estimate environmental change. It provides typical knowledge about the vegetation of a particular site that is linked with different other species for food.

Management indicators: Species composition also reflects the effects of a disturbance regime or the efficacy of efforts to mitigate disturbance effects. The management of community in a specific site is directly connected with assessment or manipulation of species composition.

Q. Describe the services of fresh water ecosystem (5)

