

Virtual University of Pakistan

Bt101

Ecology Biodiversity & Evolution

Midterm past papers solved

Email address

bt101@vu.edu.pk

Created By Zareen Fatima

Group of VU Biologists

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1.define food pyramid?2

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

2.define torpor with example?2

Ans: Torpor is a state of decreased physiological activity in an animal, usually by a reduced body temperature and metabolic rate. Torpor is a mechanism that is under physiological control. Animals can regain its normal body activities in a short period of time after remaining in a state of torpor.

Torpor enables animals to survive periods of reduced food availability. A torpor bout can refer to the period of time a hibernator spends at low body temperature, lasting days to

weeks, or it can refer to a period of low body temperature and metabolism lasting less than 24 hours, as in "daily torpor".

Examples

v Animals that undergo daily torpor include birds (even tiny hummingbirds, including many marsupial species). During the active part of their day, such animals maintain normal body temperature and activity levels, but their metabolic rate and body temperature drops during a portion of the day (usually night) to conserve energy. Torpor is often used to help animals survive during periods of colder temperatures, as it allows them to save the energy that would normally be used to maintain a high body temperature.

3.write the three reasons of animal hibernation?3

Ans:

4.differentiate between endemic and indigenous species with example?

Ans: 1. Endemic species

An endemic species is one whose habitat is restricted to a particular area. The term could refer to an animal, a plant, a fungus, or even a microorganism. Endemic species are often endangered, and particular examples may become a focus point for campaigns to protect biodiversity in a given environment. Some have become national, or regional, emblems.

Example

Blind Indus dolphin is only found in Indus river of Pakistan.

2. Indigenous species

A species is defined as indigenous to a given region or ecosystem if its presence in that region is the result of only natural process, with no human intervention. Every natural organism (as opposed to a domesticated organism) has its own natural range of distribution in which it is regarded as indigenous.

Example

Snow leopard is found in Pakistan, Nepal, India, and Russia and in some other countries of central Asia.

5.write a short note on survival ship curves?5

ANS:

6.write a note on types of soil horizon?5

Ans: 1. 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.

2. 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.

3. 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.

4. 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

What is difference between habitat and niche? 2 marks

Ans: Actual place of an organism where it lives is called its habitat or environment. A habitat is an ecological or environmental area that is inhabited by a particular species of animal, plant, or other type of organism. The term typically refers to the zone in which the organism lives and where it can

find food, shelter, protection and mates for reproduction. It is the natural environment in which an organism lives, or the physical environment that surrounds a species population.

A typical niche describes the habitat which is the actual place of living of organisms. The activity pattern of an organism that is a time period in which an organism remains active. The resources that an organism gains from the surrounding environment

What's difference between plankton and phytoplankton? 2 marks

Ans: 1. Plankton A microscopic swimming and free floating organisms in water are termed as planktons. Organisms - Saltwater and freshwater life zones contain several major types of organisms. One such type consists of weakly swimming free-floating plankton,

Phytoplankton

In oceans, lakes and slow-moving streams, phytoplanktons are the major producers. Phytoplanktons are simply microscopic floating plants. Fish and other aquatic animals eat the

phytoplankton as it floats through the water. Phytoplankton, a great source of food for a wide range of aquatic creatures including whales, shrimp, snails, and jellyfish.

Difference between prokaryotes and eukaryotes 3 marks

Ans: 1) Prokaryotes

A prokaryote is a single-celled organism that lacks a membrane bound nucleus, mitochondria, or any other membrane-bound organelle. Prokaryotes can be divided into two domains, Archaea and Bacteria. Species with nuclei and organelles are placed in the domain Eukaryota. In the prokaryotes, all the intracellular water-soluble components (proteins, DNA and metabolites) are located together in the cytoplasm enclosed by the cell membrane, rather than in separate cellular compartments. Bacteria, however, do possess protein-based bacterial microcompartments, which are thought to act as primitive organelles enclosed in protein shells.

2) Eukaryotes

A eukaryote is any organism whose cells contain a nucleus and other organelles enclosed within membranes. Eukaryotes belong to the taxon Eukarya or Eukaryota. The defining feature that sets eukaryotic cells apart from prokaryotic cells (Bacteria and Archaea) is that they have membrane-bound organelles, especially the nucleus, which contains the genetic material, and is enclosed by the nuclear envelope. Eukaryotic cells also contain other membrane-bound organelles such as mitochondria and the Golgi apparatus. In addition, plants and algae contain chloroplasts. Eukaryotic organisms may be unicellular, or multicellular. Only eukaryotes have multicellular organisms consisting of many kinds of tissue made up of different cell types

Define atmosphere and its role in ecosystem 5 marks

Ans: 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.

NOTE: for roles in ecosystem read the topic 43

What is reproductive potential and major affects 5 marks

Ans: Reproductive potential

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

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:1. What is manatee? 2 marks

Ans: . Fruit bats, hummingbirds and butterflies primarily consume plant material, and all are primary consumers, although they are not often thought of as plant-eaters. Manatee Eat 150 pounds of plants each day.

Q:3. What is the influence of non native species on environment and habitat? 3 marks

Ans: 3. Impact of non-native species

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

Q:4. What is adaptation of aestivation and give example? 3 marks.

Ans: topic 73

Q:6. Define ectotherms and enlist its characteristics. 5 mark

Ans: An ectotherm is an organism in which internal physiological sources of heat are of relatively small or quite negligible importance in controlling body temperature. Such organisms (for example frogs) rely on environmental heat sources, which permit them to operate at very economical metabolic rates. Colloquially, some refer to these organisms as "cold blooded" though such a term is not technically correct, as the blood temperature of the organism varies with ambient environmental temperature. Some of these animals live in environments where temperatures are practically constant, as is typical of regions of the abyssal ocean. The ectotherms include the fishes, amphibians, reptiles, and invertebrates. The body temperatures of aquatic ectotherms are usually very close to those of the water. In contrast, in places where temperature varies so widely as to limit the physiological activities of other kinds of ectotherms, many species habitually seek out external sources of heat or shelter from heat;

For example, many reptiles regulate their body temperature by basking in the sun, or seeking shade when necessary in addition to a whole host of other behavioral thermoregulation mechanisms. In contrast to ectotherms, endotherms rely largely, even predominantly, on heat from internal metabolic processes

Characteristics of Ectotherms

§ Low metabolic rate

§ Generate body heat from external environment

§ Body insulation is very poor

Q. Services of marine water

ANS: The main goods and services provided by marine ecosystems are:

· Resilience and resistance · Disturbance prevention · Nutrient cycling · Gas and climate regulation · Bioremediation of waste · Food provision · Raw materials, including ornamental resources · Leisure
