

1. Define Commensalism?

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

2. What is aestivation?

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

3. Major Category of Parasite?

protozoa, helminths, and ectoparasites.

4. 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.

5. Sources of nitrogen?

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

6. 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.

7. 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.

8. 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

9. 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.

10. 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

11. Theory of natural selection who and when?

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

12. 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**.

13. 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

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

15. 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.

16. 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

17. 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.

18. 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.

19. Biological clocks?

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

20. 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**.

21. Types of grazing?

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

22. 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.

23. 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)**

24. 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

25. 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

26. 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

27. 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.

28. 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)

29. Primary productivity decomposer?

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

30. 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)

31. 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)

32. Omniverse types?

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

33. 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)

34. 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)

35. Mutualism?

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

36. 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)

37. 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)

38. 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)

39. 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

40. 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)**

41. Sources of land population?

The Main Causes of Land Pollution

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

42. 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)**

43. Fundamental of niche?

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

44. 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)**

45. 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)**

46. 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)**

47. Food Web?

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

48. 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)**

49. 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)**

50. Top down effect mean?

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

51. 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

52. Name of stages of foraging?

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

53. 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)

54. Sources of wastewater

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

55. 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

56. 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

57. 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

58. 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)

59. 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)

60. 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)

61. 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)

62. Global Warming? Effect of Globule 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.

63. 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.

64. 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)

65. Invasion specis?

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.

66. 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)

67. 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.

68. 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)

69. 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)

70. 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

71. Ozone depleting substance?

Ozone Depleting Substances

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

72. 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.

73. 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

74. 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

75. Difference between Waste water treatment and Primary Secondary treatment?

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76. define food pyramid??

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

77. define torpor with example??

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.

78. 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.

79. 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

80. 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

81. 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.

82. 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 proteinbased 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 membranebound organelles, especially the nucleus, which contains the genetic material, and is enclosed by the nuclear envelope. Eukaryotic cells also contain other membranebound 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

83. Define atmosphere and it's 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

84. 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

85. 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.

86. 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.

87. What is adaptation of aestivation and give example? 3 marks.

Ans: topic 73

88. 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

89. 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

90. enlists some effects of Ozone depletion?

- Increased UV penetration
- Skin cancer in humans, basal and squamous cell carcinomas, have been strongly linked to UVB exposure.
- Malignant melanoma, lethal skin cancer related to UVA and UVB
- Cortical cataracts and UVB exposure
- Increased tropospheric ozone
- Increased production of vitamin D linked with UVB
- Cyanobacteria are sensitive to UV, indirectly affecting crops

91. define weathering and also enlist its types? 5

Weathering breaks down and loosens the surface minerals of rock so they can be transported away by agents of erosion such as water, wind and ice. There are two **types** of **weathering**: mechanical and chemical. Mechanical **Weathering**. Mechanical **weathering** is the disintegration of rock into smaller and smaller fragments

There are five major **types** of mechanical **weathering**: thermal expansion, frost **weathering**, exfoliation, abrasion, and salt crystal growth.

...

- Thermal Expansion. ...
- Abrasion and Impact. ...
- Exfoliation or Pressure Release. ...

- Frost Weathering. ...
- Salt-crystal Growth. ...
- Plant and Animal Activities.

92. define bio magnification?

Magnification is the process of enlarging the apparent size, not physical size, of something. This enlargement is quantified by a calculated number also called "magnification". When this number is less than one, it refers to a reduction in size, sometimes called minification or de-magnification.

93. define eutrophication?

Eutrophication, or hypertrophication, is when a body of water becomes overly enriched with minerals and nutrients which induce excessive growth of algae. This process may result in oxygen depletion of the water body

94. what is the function of the cell membrane?

Ans.1:-The **cell membrane** is selectively permeable to ions and organic molecules and controls the movement of substances in and out of **cells**. The basic **function of the cell membrane** is to protect the **cell** from its surroundings. It consists of the phospholipid bilayer with embedded proteins.

95. What is cell membrane and cell wall?

Ans.2:- Cell Membrane. The **cell wall** is the outer most covering of the **cell**. ... The **cell wall** is present in bacteria, fungi, algae and plant **cell**. It is absent in an animal **cell** and protozoa. The **cell membrane** is a biological **membrane**, which is semi- permeable.

96. Write a note on soil horizon?

Ans.3:- A **soil horizon** is a layer generally parallel to the soil crust, whose physical characteristics differ from the layers above and beneath

97. Define detritivores with example?

Ans.4:- Detritivores are heterotrophs that obtain their nutrition by feeding on detritus. The detritus they consume includes decomposing plant and animal parts, as well as fecal matter. These organisms play an important role in all ecosystems by getting rid of decaying organic matter left behind by other organisms. In food webs, detritivores commonly play the role of decomposers. Some common **examples of detritivores** are earthworms, who eat rotten plant leaves and other debris, and dung beetles, who eat feces. Other **examples** are millipedes, woodlice, slugs, and sea stars.

98. Define trophic level with example?

Ans: - A **trophic level** is the position in an ecosystem an organism occupies in relation to primary sources of energy and the food chain. The first **trophic level** is always composed of primary producers that convert either solar or chemical energy into biomass.

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

Survivorship Curve

- Y-axis is a logarithmic plot of numbers of survivors
- X-axis is a linear plot of age

Kinds of Survivorship Curve

Type 1 (Convex)

Populations survive to an old age, then die rapidly.

Unimportance of environmental factors in influencing mortality

Potential life span

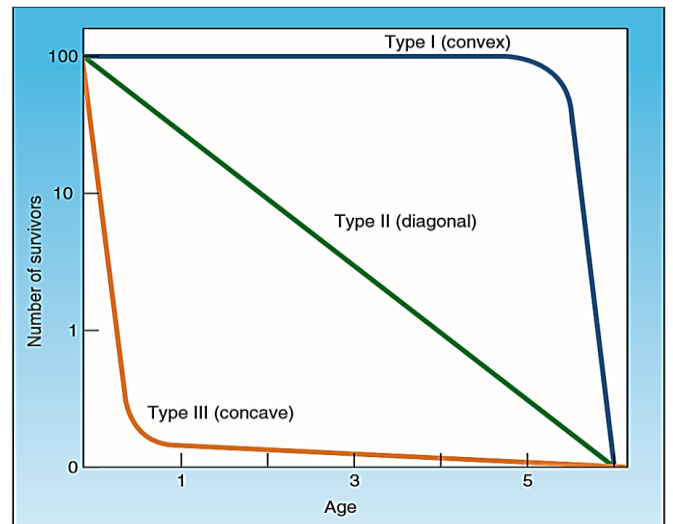
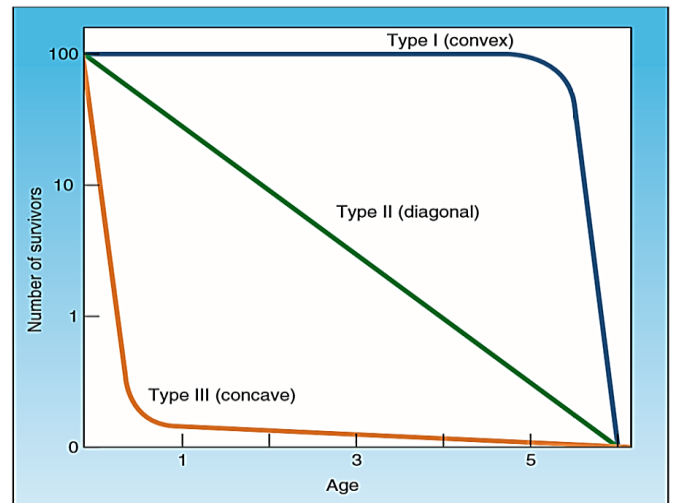
Example: Humans

Type II (Diagonal)

- Constant probability of death throughout lives
- Influence of environmental factors on mortality
- Mortality independent of age
- Example:** birds, rodents

Type III (Concave)

- High juvenile mortality
- Influence of environmental factors and less resistance of juveniles on mortality
- Lower mortality in adults
- Example:** Fish



100. 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

101. 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 membranebound 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

102. Define atmosphere and it's 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

103. 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.

104. Properties of r-selected species

• High growth rates • Typically exploit less crowded ecological habitats • Produce many offspring • Relatively low probability of surviving to adulthood

105. Acid Rain

• Unpolluted rain has an acidic pH, but usually no lower than 5.7. • This low pH is due to carbonic acid $\text{H}_2\text{O} + \text{CO}_2 \rightleftharpoons \text{H}_2\text{CO}_3 (\text{aq})$ • Nitric acid is produced as result of lightening.

106. Global Warming

• There is a gradual increase in the average temperature of the Earth's atmosphere in the last 100 years. • It has risen about 1°C since 1900. • Sources: Greenhouse effect, pollution, deforestation

107. Types of Succession

• Primary Succession

Occurring in an environment in which new substrate devoid of vegetation and other organisms usually lacking soil

• Secondary Succession

An event reduces already established ecosystem.

108. Microorganisms fixing Nitrogen

• Azobacter • Beijerinckia • Azospirillum • Clostridium • Cyanobacteria • Require the enzyme nitrogenase • Inhibited by oxygen • Inhibited by ammonia (end product)

109. Name factor that limit population growth

• Rate of Birth • Rate of Death/mortality • Dispersal • Food Resources • Space to grow • Environmental factors

110. First Atmosphere Composition

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

111. How can mimicry different from camouflage

1. Camouflage

• Use of any combination of materials, coloration, or illumination • Concealment from predators • Also known as cryptic coloration

2. Mimicry

• The resemblance of one species to another for protective or aggressive purposes • Different from camouflage

112. 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

113. Effects Noise Pollution

• 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.

114. Types of air pollution

1. Primary Air Pollutant 2. Secondary Air Pollutants

Primary Air Pollutant

• Harmful substance that is emitted directly into the atmosphere

Secondary Air Pollutant

• Harmful substance formed in the atmosphere • Primary air pollutant reacts with substances normally found in the atmosphere or with other air pollutants.

Types of Parasites

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

115. Sources of Nitrogen

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

116. Autotrophs

• Synthesis of the organic compounds of their bodies from inorganic precursors such as: - CO₂ , H₂O, NO₃ • using energy from an a biotic source - Light - inorganic oxidation reactions

117. Carbon Cycle

• Carbon is main component of living organisms. • 20% of human body is carbon by weight. • CO₂ is major source of carbon. • Atmosphere contains about 750 billion metric tons of carbon in form of CO₂ • CO₂ released in air is again available for plants. • In aquatic ecosystem, CO₂ reacts with the water to form bicarbonate ions. • Dissolved CO₂ and bicarbonates are used by algae and aquatic plants in photosynthesis. .

118. 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.

119. Layers of atmosphere

1. Exosphere: 700 to 10,000 km (440 to 6,200 miles) 2. Thermosphere: 80 to 700 km (50 to 440 miles)[12] 3. Mesosphere: 50 to 80 km (31 to 50 miles) 4. Stratosphere: 12 to 50 km (7 to 31 miles) 5. Troposphere: 0 to 12 km (0 to 7 miles)

120. Fundamental Niche

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

121. Tropospheric Ozone

Man- made pollutant in the lower atmosphere – Secondary air pollutant – Component of photochemical smog

122. Stages of Water cycle

1. Evaporation 2. Transpiration 3. Condensation 4. Precipitation 5. Surface Run off 6. Infiltration