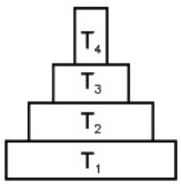
Ecosystem

Question1

Consider the pyramid of energy of an ecosystem given below:



If T_4 is equivalent to 1000 J , what is the value at T_1 ?

[NEET 2024 Re]

Options:

A.

$\frac{10000}{10}$J

B.

$\frac{10000}{10} \times 4$J

C.

10,000J

D.

10,00,000J

Answer: D

Solution:

According to the given pyramid of energy, if T_4 is equivalent to 1000 J , then according to the 10 percent law, which states that only 10 percent of energy is transferred to each trophic level from the lower trophic level, the value atT_1 is 10,00,000J.

$$T_1 = 10,00,000J$$

$$T_2 = \frac{10}{100} \times 10,00,000 = 1,00,000J$$

$$T_3 = \frac{10}{100} \times 100000 = 10,000J$$

$$T_4 = \frac{10}{100} \times 10000 = 1000J$$

Question2

Which one of the following is not a limitation of ecological pyramids?

[NEET 2024 Re]

Options:

A.

Saprophytes are not given any place in ecological pyramids

B.

It assumes a simple food chain, that almost never exists in nature

C.

It accommodates a food web

D.

It does not take into account the same species belonging to two or more trophic levels

Answer: C

Solution:

There are certain limitation of ecological pyramids.

Such as :

• It does not take into account the same species belonging to two or more trophic levels.

• It assumes a simple food chain, something that almost never exists in nature.

• It does not accommodate a food web.

• Saprophytes are not given any place in ecological pyramids even though they play a vital role in the ecosystem.

Question3

In an ecosystem if the Net Primary Productivity (NPP) of first trophic level is 100x(kcal m^{-2})yr^{-1}, what would be the GPP (Gross Primary Productivity) of the third trophic level of the same ecosystem?

[NEET 2024]

Options:

A.

$\frac{x}{10}(\text{kcal m}^{-2})\text{yr}^{-1}$

B.

$x(\text{kcal m}^{-2})\text{yr}^{-1}$

C.

$10x(\text{kcal m}^{-2})\text{yr}^{-1}$

D.

$\frac{100x}{3x}(\text{kcal m}^{-2})\text{yr}^{-1}$

Answer: C

Solution:

NPP at first trophic level would be the GPP for second trophic level. NPP at second trophic level would be GPP for third trophic level. Therefore, 100x(kcal/m^2/yr) would be GPP at second trophic level and 100x × 10% (kcal/m^2/yr) i.e., 10x(kcal/m^2/yr) energy would be GPP at third trophic level.

Question4

Match List - I with List - II

	List - I		List - II
(A)	Hydrarch succession	(I)	Gradual change in the species composition
(B)	Xerarch succession	(II)	Faster and climax reached quickly
(C)	Ecological succession	(III)	Lichens to mesic conditions
(D)	Secondary succession	(IV)	Phytoplankton to mesic conditions

Choose the correct answer from the options given below : [NEET 2023 mpr]

Options:

A.

(A)-(IV), (B)-(II), (C)-(III), (D)-(I)

B.

(A)-(III), (B)-(I), (C)-(IV), (D)-(II)

C.

(A)-(I), (B)-(IV), (C)-(II), (D)-(III)

D.

(A)-(IV), (B)-(III), (C)-(I), (D)-(II)

Answer: D

Solution:

(A) Hydrarch succession - (IV) Phytoplankton to mesic conditions. Hydrarch succession occurs in wet or aquatic areas, starting from an aquatic stage like phytoplankton and gradually moving towards mesic conditions, where the environment is neither too wet nor too dry.

(B) Xerarch succession - (III) Lichens to mesic conditions. Xerarch succession occurs in dry areas, such as deserts or rocks, and typically begins with organisms like lichens, gradually moving towards mesic conditions.

(C) Ecological succession - (I) Gradual change in the species composition. Ecological succession is the process by which the structure of a biological community evolves over time, involving a gradual change in species composition.

(D) Secondary succession - (II) Faster and climax reached quickly. Secondary succession refers to the series of community changes that occur on a preexisting, disrupted habitat and is typically faster than primary succession with the climax being reached more quickly because it begins on soil and not bare rock.

Question5

The amount of nutrients such as carbon, nitrogen, potassium and calcium present in the soil at any given time is referred to as : [NEET 2023 mpr]

Options:

A.

Standing state

B.

Standing crop

C.

Humus

D.

Detritus

Answer: A

Solution:

Solution:

Explanation : "Standing state" is a term used in ecology to denote the amount of nutrients such as carbon, nitrogen, potassium, calcium, etc., present in the soil at any given time. It provides an estimate of the availability of these nutrients in the ecosystem.

On the other hand, "Standing crop" is a term used to describe the total biomass (the mass of living biological organisms) of an organism in a particular area or volume at a specific time.
"Humus" refers to the organic component of soil, formed by the decomposition of leaves and other plant material by soil microorganisms.

"Detritus" is dead particulate organic material. It typically includes the bodies or fragments of dead organisms, as well as fecal material. Detritus is typically colonized by communities of microorganisms which act to decompose it.

Question6

The species of plants that plays a vital role in controlling the relative abundance of other species in a community is called

[NEET 2023 mpr]

Options:

A.

alien species

B.

endemic species

C.

exotic species

D.

keystone species

Answer: D

Solution:

Solution:

A keystone species plays a crucial role in maintaining the structure of an ecological community, affecting many other organisms in an ecosystem and helping to determine the types and numbers of various other species in the community. The absence of a keystone species can lead to a significant shift in the ecosystem and a loss of biodiversity.

Exotic species or Alien species are organisms that have been introduced into an area outside their normal distribution.

Endemic species are species that are native to, and only found in, a specific geographical area. This could be an island, a country, or even a particular habitat type. Endemic species often have unique adaptations to their specific environment and may be particularly vulnerable to changes in that environment, including the introduction of exotic species.

Question7

In the equation GPP − R = N PP
GPP is Gross Primary Productivity
NPP is Net Primary Productivity
R here is_
[NEET 2023]

Options:

A. Respiratory quotient

B. Respiratory loss

C. Reproductive allocation

D. Photosynthetically active radiation

Answer: B

Solution:

A considerable amount of GPP is utilised by plants in respiration. Gross primary productivity minus respiration losses (R), is the net primary productivity.

So R= Respiratory loss

Question8

Identify the correct statements:
A. Detrivores perform fragmentation.
B. The humus is further degraded by some microbes during mineralization.
C. Water soluble inorganic nutrients go down into the soil and get precipitated by a process called leaching.
D. The detritus food chain begins with living organisms.
E. Earthworms break down detritus into smaller particles by a process called catabolism.
Choose the correct answer from the options given below:
[NEET 2023]

Options:

A. B, C, D only

B. C, D, E only

C. D, E, A only

D. A, B, C only

Answer: D

Solution:

The detritus food chain begins with detritus that is dead organic matter. The saprotrophic bacteria and fungi breakdown detritus into simpler inorganic substances by a process called catabolism.

Question9

All successions irrespective of the habitat proceed to which type of climax community?
[NEET Re-2022]

Options:

A. Edaphic

B. Xeric

C. Mesic

D. Hydrophytic

Answer: C

Solution:

All successions irrespective of the habitat proceed to mesic type of climax community.

Question10

The pioneer species in a hydrarch succession are: [NEET Re-2022]

Options:

A. Filamentous algae

B. Free-floating angiosperms

C. Submerged rooted plants

D. Phytoplanktons

Answer: D

Solution:

Solution:

Hydrarch Succession is the succession in aquatic habitat like a freshly formed pond is hydrosere.

Pioneer species: It is formed by phytoplanktons i.e., minute microscopic autotrophic organisms like diatoms, unicellular colonial or filamentous green algae and blue green algae.

Question11

The species that come to appear in bare area are called [NEET Re-2022]

Options:

A. Species of seral community

B. Pioneer species

C. Invasive species

D. Competitive species

Answer: B

Solution:

The first biotic species that develops in a bare area is termed as pioneer species. Eg. Lichens on rock, phytoplanktons and zooplanktons in ponds, etc.

Question12

List-I	List-II
(a) Carbon dissolved	(i) 55 billion tons
(b) Annual fixation of Carbon through Photosynthesis	(ii) 71%
(c) PAR captured by Plants	(iii) 4×10^3 kg
(d) Productivity of oceans	(iv) 2 to 10%

Choose the correct answer from the options given below: [NEET Re-2022]

Options:

A. (a)-(iii), (b)-(ii), (c)-(i), (d)-(iv)

B. (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)

C. (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)

D. (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

Answer: D

Solution:

Solution:

71% of carbon found dissolved in oceans. Oceans acts as the largest carbon sink/reservoir and regulates amount of CO2 in atmosphere.

Annual fixation of carbon through Photosynthesis -4×10^{13}Kg$-$ according to an estimate, out of the total incident light received by earth, only 50% is suitable for Photosynthesis - PAR (Photosynthetically active radiation)

Productivity of oceans is only 55 billion tons due to low nitrogen, organic nutrients.

Question13

The amount of biomass or organic matter produced per unit area over a time period by plants during photosynthesis is called: [NEET Re-2022]

Options:

A. Net primary production

B. Secondary production

C. Primary production

D. Gross primary production

Answer: C

Solution:

The amount of biomass or organic matter produced per unit area over a time period by plants during photosynthesis is called primary production.

Question14

Given below are two statements:
Statement I: Decomposition is a process in which the detritus is degraded into simpler substances by microbes.

Statement II: Decomposition is faster if the detritus is rich in lignin and chitin.

In the light of the above statements, choose the correct answer from the options given below:
[NEET-2022]

Options:

A. Both Statement I and Statement II are correct

B. Both Statement I and Statement II are incorrect

C. Statement I is correct but Statement II is incorrect

D. Statement I is incorrect but Statement II is correct

Answer: C

Solution:

Solution:

Decomposition is the process by which decomposers breakdown complex organic matter into inorganic substances.

The rate of decomposition is controlled by chemical composition of detritus and climatic factors.

Decomposition is slower if detritus is rich in lignin and chitin and quicker, if detritus is rich in nitrogen and water soluble substances like sugars.

Question15

Which one of the following will accelerate phosphorus cycle?
[NEET-2022]

Options:

A. Burning of fossil fuels

B. Volcanic activity

C. Weathering of rocks

D. Rain fall and storms

Answer: C

Solution:

Phosphorus cycle is a sedimentary cycle. Reservoir pool of phosphorus in ecosystem is the earth’scrust or lithosphere. Weathering of rocks accelerate phosphorus cycle.

Question16

Detritivores breakdown detritus into smaller particles. This process is called:
[NEET-2022]

Options:

A. Catabolism

B. Fragmentation

C. Humification

D. Decomposition

Answer: B

Solution:

Solution:

Detritivores eg. earthworm break down detritus into smaller particles. This process is called fragmentation.

Question17

The amount of nutrients, such as carbon, nitrogen, phosphorus and calcium present in the soil at any given time, is referred as :
[NEET 2021]

Options:

A. Climax

B. Climax community

C. Standing state

D. Standing crop

Answer: C

Solution:

• Amount of all the inorganic substances or nutrients, such as carbon, nitrogen, phosphorus and calcium present in soil at any given time, is referred as standing state.

• Amount of living material present in different trophic levels at a given time, is referred as standing crop.

• Climax community is the last community in biotic succession which is relatively stable and is in near equilibrium with the environment of that area.

Question18

Which of the following statements is not correct?
[NEET 2021]

Options:

A. Pyramid of biomass in sea is generally inverted.

B. Pyramid of biomass in sea is generally upright.

C. Pyramid of energy is always upright.

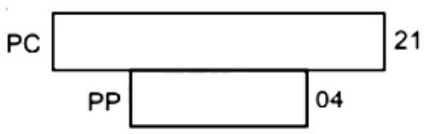
D. Pyramid of numbers in a grassland ecosystemis upright.

Answer: B

Solution:

Solution:

Pyramid of biomass in sea is inverted. For example, biomass of zooplanktons is higher than that of phytoplanktons as life span of former is longer and the latter multiply much faster though having shorter life span.



Small standing crop of phytoplanktons supports large standing crop of zooplankton

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Question19

In the equation GPP – R = NPP
R represents :
[NEET 2021]

Options:

A. Radiant energy

B. Retardation factor

C. Environmental factor

D. Respiration losses

Answer: D

Solution:

In the equation,

GPP – R = NPP

R refers to respiratory loss

GPP is gross primary productivity

NPP is net primary productivity

Question20

In relation to Gross primary productivity and Net primary productivity of an ecosystem, which one of the following statements is correct? [NEET-2020]

Options:

A. Gross primary productivity is always more than net primary productivity

B. Gross primary productivity and Net primary productivity are one and same

C. There is no relationship between Gross primary productivity and Net primary productivity

D. Gross primary productivity is always less than net primary productivity

Answer: A

Solution:

Solution:

Gross primary productivity is the total amount of photosynthates produced by producers. Net primary productivity is the assimilated photosynthate by the producers that can be passed on to the next trophic level, after being utilized for respiration and lost as heat.

So, the correct answer is 'Gross primary productivity is always more than net primary productivity'

Question21

Match the trophic levels with their correct species examples in grassland ecosystem.

	Column-I		Column-II
(a)	Fourth trophic level	(i)	Crow
(b)	Second trophic level	(ii)	Vulture
(c)	First trophic level	(iii)	Rabbit
(d)	Third trophic level	(iv)	Grass

Select the correct option

	(a)	(b)	(c)	(d)
(1)	(iii)	(ii)	(i)	(iv)
(2)	(iv)	(iii)	(ii)	(i)
(3)	(i)	(ii)	(iii)	(iv)
(4)	(ii)	(iii)	(iv)	(i)

[NEET-2020]

Options:

A. a

B. b

C. c

D. d

Answer: D

Solution:

Grassland ecosystem is a terrestrial ecosystem. It includes various trophic levels

First trophic level (T_1) – Grass
Second trophic level (T_2) – Rabbit
Third trophic level (T_3) – Crow
Fourth trophic level (T_4) – Vulture

Question22

Which of the following ecological pyramids is generally inverted? [NEET 2019]

Options:

A. Pyramid of energy

B. Pyramid of biomass in a forest

C. Pyramid of biomass in a sea

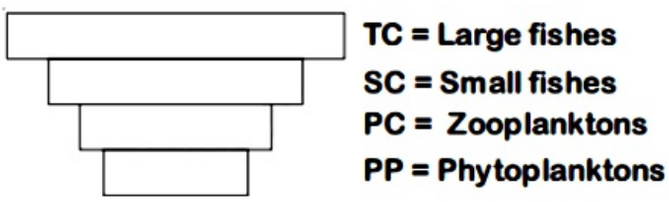
D. Pyramid of numbers in grassland

Answer: C

Solution:

Solution:

In an aquatic ecosystem, the pyramid of biomass is generally inverted.



Question23

Niche is
[NEET 2018]

Options:

A. All the biological factors in the organism's environment

B. The physical space where an organism lives

C. The functional role played by theorganism where it lives

D. The range of temperature that the organism needs to live

Answer: C

Solution:

Solution:

Ecological niche was termed by J. Grinnell. It refers the functional role played by the organism where it lives.

Question24

What type of ecological pyramid would be obtained with the following data?
Secondary consumer : 120 g
Primary consumer : 60 g
Primary producer : 10 g
[NEET 2018]

Options:

A. Inverted pyramid of biomass

B. Pyramid of energy

C. Upright pyramid of biomass

D. Upright pyramid of numbers

Answer: A

Solution:

Solution:

The given data depicts the inverted pyramid of biomass, usually found inaquatic ecosystem.

Pyramid of energy is always upright

Upright pyramid of biomass and numbers are not possible, as the data depicts primary producer is less than primary consumer and this is less than secondary consumers.

Question25

Which ecosystem has the maximum biomass ? [NEET 2017]

Options:

A. Grassland ecosystem

B. Pond ecosystem

C. Lake ecosystem

D. Forest ecosystem

Answer: D

Question26

The primary producers of the deep-sea hydrothermal vent ecosystem are [NEET 2016 P2]

Options:

A. coral reefs

B. green algae

C. chemosynthetic bacteria

D. blue-green-algae

Answer: C

Question27

Which of the following would appear as the pioneer organisms on bare rocks ?
[NEET 2016 P1]

Options:

A. Green algae

B. Lichens

C. Liverworts

D. Mosses

Answer: B

Solution:

Solution:

Lichens are pioneer organisms on bare rocks as they corrode the rocks by secreting enzyme & converted into soil.

Question28

Which one of the following is a characteristic feature of cropland ecosystem?
[NEET 2016 P1]

Options:

A. Ecological succession

B. Absence of soil organisms

C. Least genetic diversity

D. Absence of weeds

Answer: C

Question29

The term ecosystem was coined by :
[NEET 2016 P1]

Options:

A. E. Warming

B. E.P.Odum

C. A.G. Tansley

D. E. Haeckel

Answer: C

Question30

Most animals that live in deep oceanic waters are - [NEET 2015]

Options:

A. primary consumers

B. detritivores

C. tertiary consumers

D. secondary consumers

Answer: B

Solution:

Solution:
Detritivores are the organisms which feed on dead plants and animal residues.

Question31

During ecological succession : [NEET 2015]

Options:

A. the establishment of a new biotic community is very fast in its primary phase.

B. the numbers and types of animals remain constant.

C. the changes lead to a ommunity that is in near equilibrium with the environment and is called pioneer community

D. the gradual and predictable change in species composition occurs in a given area

Answer: D

Solution:

The gradual and predictable change, in the composition of species takes place in a given area during ecological succession.

Question32

In which of the following, both pairs have correct combination? [NEET 2015]

Options:

A. Gaseous nutrient cycle-Sulphur and Phosphorus, Sedimentary nutrient cycle-Carbon and Nitrogen

B. Gaseous nutrient cycle-Sulphur and Phosphorus, Sedimentary nutrient cycle-Carbon and sulphur

C. Gaseous nutrient cycle-Carbon and sulphur, Sedimentary nutrient cycle-Nitrogen and sulphur

D. Gaseous nutrient cycle-Carbon and nitrogen, Sedimentary nutrient cycle -Sulphur and Phosphorus

Answer: D

Solution:

Solution:
Carbon and Nitrogen are gaseous nutrient cycle. Sulphur and phosphorus are sedimentary nutrient cycle.

Question33

The mass of living material at a trophic level at a particular time is called :
[NEET 2015 C]

Options:

A. Standing state

B. Net primary productivity

C. Standing crop

D. Gross primary productivity

Answer: C

Question34

Vertical distribution of different species occupying different levels in a biotic community is known as:
[NEET 2015 C]

Options:

A. Stratification

B. Zonation

C. Pyramid

D. Divergence

Answer: A

Question35

Secondary Succession takes place on/in :
[NEET 2015 C]

Options:

A. Degraded forest

B. Newly created pond

C. Newly cooled lava

D. Bare rock

Answer: A

Question36

Most animals are tree dwellers in a:-
[NEET 2015 C]

Options:

A. Thorn woodland

B. Temperate deciduous forest

C. Tropical rain forest

D. Coniferous forest

Answer: C

Question37

In an ecosystem the rate of production of organic matter during photosynthesis is termed as:
[NEET 2015 C]

Options:

A. Gross primary productivity

B. Secondary productivity

C. Net productivity

D. Net primary productivity

Answer: A

Question38

Match the following and select the correct option:

(a) Earthworm	(i) Pioneer species
(b) Succession	(ii) Detrivore
(c) Ecosystem service	(iii) Natality
(d) Population growth	(iv) Pollination

[NEET 2014]

Options:

A. (i) (ii) (iii) (iv) [a b c d]

B. (iv) (i) (iii) (ii)

C. (iii) (ii) (iv) (i)

D. (ii) (i) (iv) (iii)

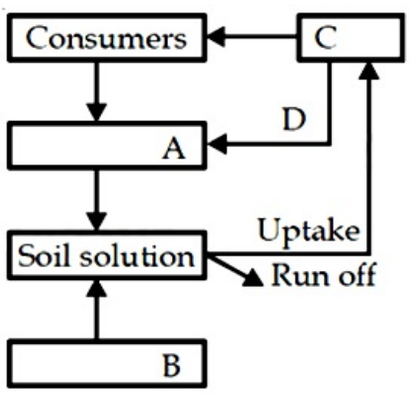
Answer: D

Solution:

Solution:
Detrivores, (eg. earthworm) break down detritus into smaller particles.
The species that invade a base area in succession is called pioneer species.

Question39

Given below is a simplified model of phosphorus cycling in a terrestrial ecosystem with four blanks (A-D).Identify the blanks.



	A	B	C	D
(1)	Rock minerals	Detritus	Litter fall	Producers
(2)	Litter	Producers	Rock minerals	Detritus
(3)	Detritus	Rock minerals	Producer	Litter fall
(4)	Producers	Litter fall	Rock minerals	Detritus

[NEET 2014]

Options:

A. (1)

B. (2)

C. (3)

D. (4)

Answer: C

Solution:

A – Detritus
B – Rock minerals
C – Producer
D – Litter fall

Question40

If 20J of energy is trapped at producer level, then how much energy will be available to peacock as food in the following chain?
plant →mice→ snake→ peacock
[NEET 2014]

Options:

A. 0.02 J

B. 0.002 J

C. 0.2 J

D. 0.0002 J

Answer: A

Solution:

Plant → 20 J
Mice → 20 × 10% = 2 J
Snake → 2 × 10% = 0.2 J
Peacock → 0.2 × 10% = 0.02 J

Question41

Natural reservoir of phosphorus is (NEET 2013)

Options:

A. rock

B. fossils

C. sea water

D. animal bones

Answer: A

Solution:

Solution:
(a) : The reservoir pool of phosphorus is in phosphate rocks while the cycling pool is soil and water for terrestrial and aquatic ecosystems respectively. Small amount of phosphate is always being added to the cycling pool through weathering of rocks. Phosphate is generally found in soil in combination with calcium, iron and aluminium. Atmosphere or gaseous cycle is absent. Phosphate circulates in the abiotic environment in lithosphere as well as hydrosphere.

Question42

Secondary productivity is rate of formation of new organic matter by (NEET 2013)

Options:

A. consumers

B. decomposers

C. producers

D. parasites

Answer: A

Solution:

(a) : The rate of photosynthesis of organic matter by the consumers is known as secondary productivity. It depends upon the loss while transferring energy containing organic matter from the previous trophic level plus the consumption due to respiration and predation. Therefore, net productivity decreases with each trophic level.

Question43

Which one of the following processes during decomposition is correctly described?
(NEET 2013)

Options:

A. Catabolism − Last step in the decomposition under fully anaerobic condition

B. Leaching - Water soluble inorganic nutrients rise to the top layers of soil

C. Fragmentation - Carried out by organisms such as earthworm

D. Humification - Leads to the accumulation of a dark coloured substance humus which undergoes microbial action at a very fast rate

Answer: C

Solution:

Solution:
(c) : Decomposition is the process in which decomposers break down complex organic matter into inorganic substances like carbon dioxide, water and nutrients. The important steps in the process of decomposition are fragmentation, leaching, catabolism, humification and mineralisation. Detritivores (e.g., earthworm) break down detritus into smaller particles. This process is called fragmentation. By the process of leaching, water soluble inorganic nutrients go down into the soil horizon and get precipitated as unavailable salts. Bacterial and fungal enzymes degrade detritus into simpler inorganic substances. This process is called as catabolism. Humification and mineralisation occur during decomposition in the soil. Humification leads to accumulation of a dark coloured amorphous substance called humus that is highly resistant to microbial action and undergoes decomposition at an extremely slow rate. The humus is further degraded by some microbes and release of inorganic nutrients occur by the process known as mineralisation.

Question44

Which two distinct microbial processes are responsible for the release of fixed nitrogen as dinitrogen gas (N_2) to the atmosphere?
(KN NEET 2013)

Options:

A. Aerobic nitrate oxidation and nitrite reduction

B. Decomposition of organic nitrogen and conversion of dinitrogen to ammonium compounds

C. Enteric fermentation in cattle and nitrogen fixation by Rhizobium in root nodules of legumes

D. Anaerobic ammonium oxidation and denitrification

Answer: D

Solution:

Solution:
(d) : Denitrification is a chemical process in which nitrates in the soil are reduced to molecular nitrogen (N_2) which is released into the atmosphere. It is done by denitrifying bacteria like Pseudomonas denitrificans. Anaerobic oxidation of ammonium (NH_4) also releases nitrogen in the atmosphere.

Question45

Which of the following is a primary consumer in maize field ecosystem? (KN NEET 2013)

Options:

A. Grasshopper

B. Wolf

C. Phytoplankton

D. Lion

Answer: A

Solution:

Solution:
(a) : Primary consumers are herbivorous organisms that feed on producers. Carnivores are termed secondary, tertiary etc., consumers depending upon their position in food chain. In food chain on land, grasshopper is a herbivore (primary consumer) while wolf and lion are carnivores. Phytoplanktons are producers in aquatic food chains.

Question46

When man eats fish which feeds on zooplanktons which have eaten small plants, the producer in this chain is (KN NEET 2013)

Options:

A. small plants

B. fish

C. man

D. zooplankton

Answer: A

Solution:

(a) :The transfer of food energy from producers to consumers through a series of organisms with repeated eating and being eaten is known as food chain. Green plants are always the first link of food chain because they alone are capable of synthesising organic food by using light energy by photosynthesis. The logical sequence of a food chain is :
Producer → Consumers → Decomposer
Small plants (Primary producer) → Zooplanktons (Primary consumer) → Fish (Secondary consumer) → Man (Tertiary consumer)

Question47

Which one of the following is not a gaseous biogeochemical cycle in ecosystem?
(2012)

Options:

A. Sulphur cycle

B. Phosphorus cycle

C. Nitrogen cycle

D. Carbon cycle

Answer: B

Solution:

(b) : Biogeochemical cycles are of two types:
gaseous and sedimentary. In gaseous nutrient cycles, the materials involved in circulation between biotic and abiotic components of biosphere are gases or vapours and the reservoir pool is atmosphere or hydrosphere, e.g., carbon, hydrogen, oxygen, nitrogen, water. In sedimentary nutrient cycles, materials involved in circulation between biotic and abiotic components of biosphere are nongaseous and the reservoir pool is lithosphere, e.g., phosphorus, calcium, magnesium. Sulphur has both sedimentary and gaseous nutrient cycles.

Question48

Identify the possible link "A" in the following food chain.
Plant → Insect → Frog → "A" → Eagle
(2012)

Options:

A. Rabbit

B. Wolf

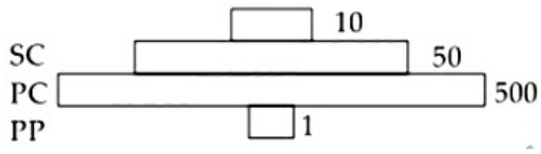
C. Cobra

D. Parrot

Answer: C

Question49

Given below is an imaginary pyramid of numbers. What could be one of the possibilities about certain organisms at some of the different levels?



(2012)

Options:

A. Level PC is "insects" and level SC is "small insectivorous birds".

B. Level PP is "phytoplanktons" in sea and "whale" on top level TC

C. Level one PP is "pipal trees" and the level SC is "sheep".

D. Level PC is "rats" and level SC is "cats".

Answer: A

Question50

Which one of the following is not a functional unit of an ecosystem? (2012)

Options:

A. Energy flow

B. Decomposition

C. Productivity

D. Stratification

Answer: D

Solution:

(d) : Four important functional aspects of the ecosystem are productivity, decomposition, energy flow and nutrient cycling.

Question51

The upright pyramid of number is absent in (2012)

Options:

A. pond

B. forest

C. lake

D. grassland

Answer: B

Solution:

Solution:
(b) : In forests, a single tree can support a large number of birds thus base showing producers in a pyramid of number will be narrower than the next slab showing primary consumers. Hence an upright pyramid of number is not formed in a forest ecosystem.

Question52

The rate of formation of new organic matter by rabbit in a grassland, is called (Mains 2012)

Options:

A. net productivity

B. secondary productivity

C. net primary productivity

D. gross primary productivity

Answer: B

Solution:

(b) : The rate of resynthesis of organic matter by consumers or the rate at which food energy is assimilated at the trophic level of consumers is called secondary productivity. In a grassland ecosystem, the rate of formation of new organic matter by rabbit is referred as secondary productivity.

Question53

The second stage of hydrosere is occupied by plants like (Mains 2012)

Options:

A. Azolla

B. Typha

C. Salix

D. Vallisneria

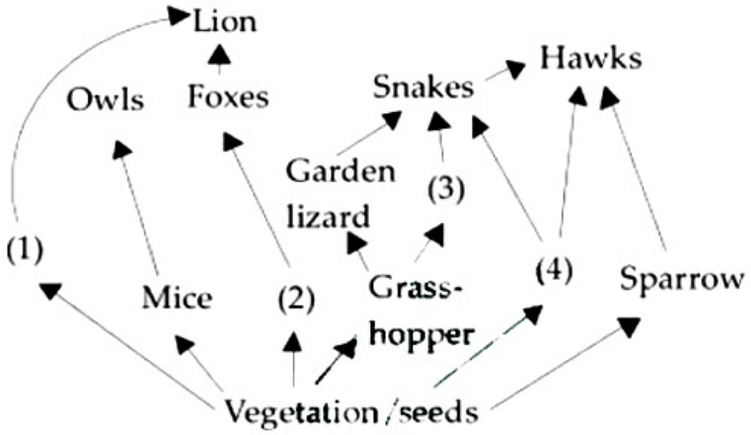
Answer: D

Solution:

Solution:
(d) : Series of biotic communities that develop one after the other in a newly formed pond or lake is called hydrosere. It starts as soon as the muddy water becomes clear. The pioneer stage of hydrosere is plankton stage. Death and decomposition of planktons in the first seral stage of hydrosere produces organic matter which mixes up with clay and silt at the bottom to form soft mud which is favourable for growth of submerged hydrophytes in the next seral stage. Hence, the second stage of hydrosere is occupied by submerged hydrophytes like Vallisneria.

Question54

Identify the likely organisms (1),(2),(3) and (4) in the food web shown below.



	(1)	(2)	(3)	(4)
(a)	Deer	Rabbit	Frog	Rat
(b)	Dog	Squirrel	Bat	Deer
(c)	Rat	Dog	tortoise	Crow
(d)	Squirrel	Cat	Rat	Pigeon

(Mains 2012)

Options:

A. (a)

B. (b)

C. (c)

D. (d)

Answer: A

Solution:

Solution:
(a) Food web is a network of food chains or feeding relationships by which energy and nutrients are passed on from one species of living organisms to another.

Question55

Mass of living matter at a trophic level in an area at any time is called (2011)

Options:

A. standing crop

B. detritus

C. humus

D. standing state

Answer: A

Solution:

Solution:
(a) : Standing crop is the total amount of living material in a specified population at a particular time, expressed as biomass (standing biomass) or its equivalent in terms of energy. The standing crop may vary at different times of the year; for example, in a population of deciduous trees between summer and winter.

Question56

Of the total incident solar radiation the proportion of PAR is (2011)

Options:

A. about 70%

B. about 60%

C. less than 50%

D. more than 80%

Answer: C

Solution:

Solution:
(c) : The source of energy in all ecosystem is solar energy. About 50% of the solar energy incident over earth is present in PAR (Photosynthetically active radiation). About $1-5\%$ of incident solar radiation or $2-10\%$ of PAR is captured by the photosynthetic organisms in the synthesis of organic matter (gross primary productivity). Roughly 20% of it is consumed in respiration so that net capture of energy (net primary productivity) is $0.8-4\%$ of incident radiation or $1.6-8\%$ of PAR.

Question57

Which one of the following statements is correct for secondary succession? (2011)

Options:

A. It begins on a bare rock.

B. It occurs on a deforested site.

C. It follows primary succession.

D. It is similar to primary succession except that it has a relatively fast pace

Answer: B

Solution:

Solution:
(b) : Secondary succession begins in areas where natural biotic communities have been destroyed such as in abandoned farm lands, burned or cut forests (deforested site), lands that have been flooded etc.

Question58

Which one of the following statements for the pyramid of energy is incorrect ?
(2011)

Options:

A. Its base is broad.

B. It shows energy content of different trophic level organisms.

C. It is inverted in shape.

D. It is upright in shape

Answer: C

Solution:

Solution:
(c) : Pyramid of energy is always upright, can never be inverted, because when energy flows from a particular trophic level to the next trophic level, some energy is always lost as heat at each step.

Question59

Which one of the following animas may occupy more than one trophic levels in the same ecosystem at the same time?
(Mains 2011)

Options:

A. Sparrow

B. Lion

C. Goat

D. Frog

Answer: A

Solution:

Solution:
(a) : Sparrow can be herbivorous (eating seeds and fruits) or carnivorous (eating insects).

Question60

Both hydrarch and xerarch successions lead to (Mains 2011)

Options:

A. medium water conditions

B. xeric conditions

C. highly dry conditions

D. excessive wet conditions

Answer: A

Solution:

Solution:
(a) : Hydrarch succession takes place in wetter areas and the successional series progress from hydric to the mesic condition . Xerach succession takes place in dry areas and the series progress from xeric to mesic condition. Hence, both hydrach and xerach succession leads to medium water conditions (mesic).

Question61

The breakdown of detritus into smaller particles by earthworm is a process called (Mains 2011)

Options:

A. humification

B. fragmentation

C. mineralisation

D. catabolism

Answer: B

Solution:

(b) : Decomposition is the process in which decomposers break down complex organic matter into inorganic substances like carbon dioxide, water and nutrients. The important steps in the process of decomposition are fragmentation, leaching, catabolism, humification and mineralisation. Detritivores (e.g., earthworm) break down detritus into smaller particles. This process is called fragmentation. By the process of leaching, water soluble inorganic nutrients go down into the soil horizon and get precipitated as unavailable salts. Bacterial and fungal enzymes degrade detritus into simpler inorganic substances. This process is called as catabolism. Humification and mineralisation occur during decomposition in the soil. Humification leads to accumulation of a dark coloured amorphous substance called humus that is highly resistant to microbial action and undergoes decomposition at an extremely slow rate. The humus is further degraded by some microbes and release of inorganic nutrients occur by the process known as mineralisation.

Question62

The biomass available for consumption by the herbivores and the decomposers is called (2010)

Options:

A. net primary productivity

B. secondary productivity

C. standing crop

D. gross primary productivity

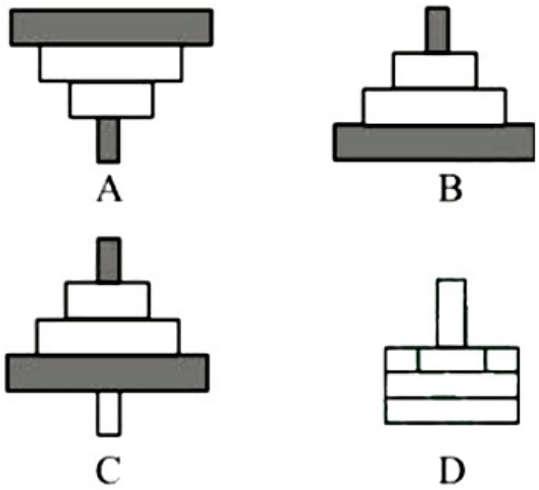
Answer: A

Solution:

Solution:
(a) : The total organic matter synthesised by the producers in the process of photosynthesis per unit time and area is known as gross primary productivity, Net primary productivity is equal to the rate of organic matter created by photosynthesis minus the rate of respiration and other losses. It is actually the biomass available for consumption by the herbivores and the decomposers.

Question63

Which of the following representations shows the pyramid of numbers in a forest ecosystem?



(Mains 2010)

Options:

A. D

B. A

C. B

D. C

Answer: D

Solution:

Solution:
An ecological pyramid shows the relationship of biomass, productivity or energy at different trophic levels. The primary producers are generally shown at the bottom and apex predators at the top. The pyramids are different for different ecosystems.
The pyramid of numbers shows the number of individual organisms at successive trophic levels. In a forest ecosystem, the producers are large size trees that make the base of the Pyramid. The herbivores such as fruit-eating birds, deer, elephants, etc. make the primary consumers and are less than primary producers. After that, the number goes down at each successive level. Thus, a Pyramid of numbers in a Forest Ecosystem is partially upright or spindle-shaped. C is Spindle Shaped.

Question64

The correct sequence of plants in a hydrosere is (2009)

Options:

A. Volvox → Hydrilla → Pistia → Scirpus → Lantana → Oak

B. Pistia → Volvox → Scirpus → Hydrilla → Oak → Lantana

C. Oak → Lantana → Volvox → Hydrilla [Pistia → Scirpus

D. Oak → Lantana → Scirpus → Pistia Hydrilla → Volvox

Answer: A

Solution:

(a) : Hydrosere, originating in water (pond, pools, lakes etc.) and starts with the colonization of some phytoplanktons which form the pioneer plant community, and finally terminates into a forest, which is a climax community together with their chief components of vegetation.
The various stages together with their components of plant species of a hydrosere are phytoplankton stage, rooted submerged stage, rooted floating stage, reed swamp stage, marsh or sedge meadow stage, woodland stage and climax forest stage. Volvox is phytoplankton, Hydrilla is rooted submerged plant, Pistia is rooted floating plant, Scirpus is reed swamp plant, Lantana is sedge meadow plant and oak is woody tree.

Question65

Which one of the following types of organisms occupy more than one trophic level in a pond ecosystem?
(2009)

Options:

A. Fish

B. Zooplankton

C. Frog

D. Phytoplankton

Answer: A

Solution:

Solution:
(a) : A single species may occupy more than one trophic level. In pond, fish occupy more than one trophic level. Small fishes act as secondary consumer. They feed on primary consumer. Large fishes act as tertiary consumer. They feed on smaller fish.

Question66

Consider the following statements concerning food chains.
A. Removal of 80% tigers from an area resulted in greatly increased growth of vegetation.
B. Removal of most of the carnivores resulted in an increased population of deers.
C. The length of food chains is generally limited to 3 − 4 trophic levels due to energy loss.
D. The length of food chains may vary from 2 to 8 trophic levels Which two of the above statements are correct?
(2009)

Options:

A. A, D

B. A, B

C. B, C

D. C, D

Answer: C

Solution:

Solution:
(c): Removal of 80% tigers (i.e., tertiary consumer) from an area resulted in decreased growth of vegetation because there will be increased numbers of secondary or primary consumers which feeds on green plant. Removal of most of the carnivores resulted in an increased population of deers on which carnivores depends. The length of food chain is generally limited to $3-4$ trophic level due to energy loss because all the food available at one level is neither eaten nor used by animals at the next level and a lot of the energy is lost in respiration to drive the organisms metabolism so less energy is left to support higher trophic level.

Question67

The slow rate of decomposition of fallen logs in nature is due to their (2008)

Options:

A. anaerobic environment around them

B. low cellulose content

C. low moisture content

D. poor nitrogen content

Answer: D

Solution:

Solution:
(d) : Decomposition is largely an oxygen requiring process. The rate of decomposition is controlled by chemical composition of detritus and climatic factors. In a particular climatic condition, decomposition rate is slower if detritus is rich in lignin and chitin, and quicker, if detritus is rich in nitrogen and water-soluble substances like sugar. Temperature and soil moisture are the most important climatic factors that regulate decomposition through their effects on the activities of soil microbes. Warm and moist environment favour decomposition whereas low temperature and anaerobiosis inhibit decomposition resulting in build up of organic materials.

Question68

About 70% of total global carbon is found in (2008)

Options:

A. oceans

B. forests

C. grasslands

D. agroecosystems

Answer: A

Solution:

Solution:
(a) : Carbon constitutes 49% of dry weight of organism and is next only to water. Among the total quantity of global carbon 71% is found in oceans in dissolved form whereas only 1% is found in atmosphere. Carbon cycling occurs through atmosphere, ocean and living or dead organism.

Question69

Which one of the following ecosystem types has the highest annual net primary productivity?
(2007)

Options:

A. Tropical deciduous forest

B. Temperate evergreen forest

C. Temperate deciduous forest

D. Tropical rainforest

Answer: D

Solution:

(d) : Net primary productivity is the total organic matter stored by producers per unit area per unit time. Gross primary productivity is the total organic matter synthesised by producers in the process of photosynthesis per unit area per unit time. So,
Net primary productivity = Gross productivity Respiration and other losses
Tropical rainforests occur over equatorial/ subequatorial regions with abundant warmth and rainfall. Diversity and productivity are maximum as compared to other regions.

Question70

Which one of the following is not used for construction of ecological pyramids?
(2006)

Options:

A. Fresh weight

B. Dry weight

C. Number of individuals

D. Rate of energy flow

Answer: A

Solution:

Solution:
(a) : Ecological pyramids represents the trophic structure and trophic function of an ecosystem. In an ecological pyramid, the first trophic level forms the base and successive trophic levels the tiers which make up the apex. Ecological pyramids may be of three general types pyramid of number, pyramid of biomass and pyramid of energy. Pyramid of biomass i.e. the living weight of the organisms of the food chain present at any time in an ecosystem forms the pyramids of biomass. The pyramid of biomass indicates the decrease or the gradual reduction in biomass at each trophic levels from base to apex. Fresh weight is not used in ecological pyramids.

Question71

Which of the following is expected to have the highest value (gm / m^2 / yr) in a grassland ecosystem? (2004)

Options:

A. Secondary production

B. Tertiary production

C. Gross production (GP)

D. Net production (NP)

Answer: C

Solution:

Solution:
(c) : Productivity is rate of accumulation of energy containing organic matter by an ecosystem per unit area per unit time. It is of two types- primary and secondary. Productivity at producers level is known as primary productivity. It is two types: Gross primary productivity is primary productivity including that amount which is utilized in respiration and other metabolic activities. Net primary productivity (NPP) is primary productivity in excess to that which is utilised in respiration and other metabolic activities.
NPP = GP − Respiration
Secondary productivity is productivity at consumers level. since gross production includes total production including the amount utilized in respiration and other metabolic activities so it is more than other forms of productivity.

Question72

An ecosystem which can be easily damaged but can recover after some time if damaging effect stops will be having
(2004)

Options:

A. low stability and high resilience

B. high stability and low resilience

C. low stability and low resilience

D. high stability and high resilience.

Answer: A

Solution:

Solution:
(a) : Stability can be defined as the power of a system to be in their state against unfavourable factors and resilience is the capability of regaining its original shape or position after being deformed. An ecosystem can be damaged easily and it must be having high resilience.

Question73

Bamboo plant is growing in a fir forest then what will be the trophic level of it?
(2002)

Options:

A. First trophic level (T_1)

B. Second trophic level (T_2)

C. Third trophic level (T_3)

D. Fourth trophic level (T_4)

Answer: A

Solution:

Solution:
(a) : Trophic structure of ecosystem is a type of producer-consumer arrangement, in which each food level is called trophic level and the graphical representation of trophic structure of ecosystem constitutes ecological pyramids. The

green plants are producers and represent the first trophic level (T_1). So bamboo plant is the first trophic level (T_1).

Question74

Plant decomposers are (2001)

Options:

A. monera and fungi

B. fungi and plants

C. protista and animalia

D. animalia and monera

Answer: A

Solution:

Solution:
(a) : Microorganisms (bacteria and fungi) are decomposers of the ecosystem. They feed upon dead decaying living organisms (both plant and animals) and break them into simpler compounds. These are released free in the atmosphere and are utilized by producers for the synthesis of their food materials. They mainly belong to monera and fungi.

Question75

Which is the reason for highest biomass in aquatic ecosystem? (2001)

Options:

A. Nano plankton, blue green algae and green algae

B. Sea grass and slime moulds

C. Benthoic and brown algae

D. Diatoms

Answer: C

Solution:

Solution:
(c) : The benthic region includes all the sea floor from the wave-washed shore-line to the greatest depths. Depending upon the penetration of light it is subdivided into two main zones : the lighted or littoral zone and the deep sea system. Due to abundance of light, water, oxygen, carbon dioxide and less salinity of water, the tidal zone is characterized by exhorbitant growth of plants. The dense growth of vegetation, on the other hand, provides shelter and food for animals. A

wide variety of algae, few grasses and animals of every phylum of animal kingdom are represented in this region.

Question76

Energy transfer from one trophic level to other, in a food chain, is (1999)

Options:

A. 10 %

B. 20 %

C. 1 %

D. 2 %

Answer: A

Solution:

Solution:
(a) : Herbivores are eaten by primary carnivores. Only 10% of the herbivores productivity is utilized for raising productivity of primary carnivores. The rest is consumed in ingestion, respiration, maintenance of body heat and other activities. Higher carnivores similarly are able to retain only 10% of energy present in primary carnivores. It is called 10% law which was proposed by Lindemann. Accordingly, if plant trapped 20J of energy, mice will have 2J, snake will have 0.2J and hence, peacock will have 0.02J of energy.

Question77

In a terrestrial ecosystem such as forest, maximum energy is in which trophic level?
(1998)

Options:

A. T_3

B. T_4

C. T

D. T_2

Answer: C

Solution:

(c) : In a terrestrial ecosystem maximum energy is in trophic level I because the organisms which trap solar energy are primary producers and they have got maximum energy. Only 10% energy is transferred from one trophic level to next trophic level.

Question78

The rate at which light energy is converted into chemical energy of organic molecules is the ecosystem's
(1998)

Options:

A. net secondary productivity

B. gross primary productivity

C. net primary productivity

D. gross secondary productivity

Answer: B

Solution:

Solution:
(b) The rate at which organic molecules are formed in a green plant is called gross primary productivity.

Question79

Which of the following ecosystem has the highest gross primary productivity?
(1997)

Options:

A. Mangroves

B. Rainforest

C. Grassland

D. Coral reef

Answer: B

Solution:

(b) : Gross primary productivity is the total rate of photosynthesis, including the organic matter used up in respiration during the measurement period. Tropical evergreen\/rainforests occur over equatorial\/subequatorial regions with

abundant warmth and rainfall ($200 - 350 \mathrm{cm} / \mathrm{yr}$) almost throughout the year. The forests are impenetrable (= jungle) with maximum diversity, e.g., 200 types of trees in one hectare, $70 - 80\%$ of all insects $80 - 85\%$ of all birds. Productivity is maximum here, $12000 \mathrm{kcal} / \mathrm{m}^2 / \mathrm{yr}$

Question80

Which of the following acts as "nature's scavengers"? (1997)

Options:

A. Insects

B. Microorganisms

C. Man

D. Animals

Answer: B

Solution:

Solution:
(b) : Microorganisms (bacteria and mould) are decomposers of the ecosystem. They feed upon dead decaying organisms (both plant and animals) and break them into simpler compounds. These are released free in the atmosphere and are utilized by producers for the synthesis of their food materials. They are called nature's scavengers as they are consumers of dead matter.

Question81

The 10% energy transfer law of food chain was given by (1996)

Options:

A. Lindemann

B. Tansley

C. Stanley

D. Weismann

Answer: A

Solution:

Solution:
(a) : Herbivores are eaten by primary carnivores. Only 10% of the herbivores productivity is utilized for raising productivity of primary carnivores. The rest is consumed in ingestion, respiration, maintenance of body heat and other

activities. Higher carnivores similarly are able to retain only 10% of energy present in primary carnivores. It is called 10% law which was proposed by Lindemann. Accordingly, if plant trapped 20 J of energy, mice will have 2 J, snake will have 0.2 J and hence, peacock will have 0.02 J of energy.

Question82

If we completely remove the decomposers from an ecosystem, its functioning will be adversely affected, because (1995)

Options:

A. mineral movement will be blocked

B. the rate of decomposition will be very high

C. energy flow will be blocked

D. herbivores will not receive solar energy

Answer: A

Solution:

Solution:
(a) : Decomposers are saprotrophs which decompose the organic remains by secreting extracellular digestive enzymes. They are also known as mineralisers as they release minerals trapped in organic remains. So in the absence of microorganisms the flow of minerals will stop.

Question83

In a biotic community, the primary consumers are (1995)

Options:

A. detritivores

B. herbivores

C. carnivores

D. omnivores

Answer: B

Solution:

Solution:
(d) In a biotic community the herbivores (goat, deer) are those animals, which consume the primary producers (green

plants). Hence they are primary consumers.

Question84

Which of the following pairs is a sedimentary type of biogeochemical cycle?
(1995)

Options:

A. Phosphorus and nitrogen

B. Phosphorus and sulphur

C. Oxygen and nitrogen

D. Phosphorus and carbon dioxide

Answer: B

Solution:

Solution:
(b) : Biogeochemical cycles are of two types:
gaseous and sedimentary. In gaseous nutrient cycles, the materials involved in circulation between biotic and abiotic components of biosphere are gases or vapours and the reservoir pool is atmosphere or hydrosphere, e.g., carbon, hydrogen, oxygen, nitrogen, water. In sedimentary nutrient cycles, materials involved in circulation between biotic and abiotic components of biosphere are nongaseous and the reservoir pool is lithosphere, e.g., phosphorus, calcium, magnesium. Sulphur has both sedimentary and gaseous nutrient cycles.

Question85

Which of the following is the most stable ecosystem?
(1995)

Options:

A. Mountain

B. Ocean

C. Forest

D. Desert

Answer: B

Solution:

(b) : Of all the ecosystems, ocean is the largest and most stable ecosystem. Aquatic life is protected from vigorous climates and weather that are climatic conditions, problem of water supply, food, fire and artificial forces such as industrialization, farming and grazing are lacking in the oceans. The sea is continuous and not separated as land and freshwater habitats.

Question86

The primary succession refers to the development of communities on a (1995)

Options:

A. forest clearing after devastating fire

B. newly-exposed habitat with no record of earlier vegetation

C. freshly cleared crop field

D. pond, freshly filled with water after a dry phase

Answer: B

Solution:

Solution:
(b) : When succession begins on an area which has not been previously being occupied by a community, e.g., a new exposed rock area, sand dunes, new islands, deltas, shore or recent lava flow, it is known as primary succession. The first group of organisms (plants or animals) which become established in such an area is termed the pioneer community.

Question87

The dominant second trophic level, in a lake ecosystem, is (1994)

Options:

A. phytoplankton

B. zooplankton

C. benthos

D. plankton

Answer: B

Solution:

Solution:
(b) : Trophic level is a step or division of food chain which is characterized by the method of obtaining its food. The two fundamental trophic levels are producers and consumers. Producers belong to the first trophic level. In a lake the

producers are mainly some rooted or floating plants and phytoplanktons. Primary consumers form the second trophic level. They feed on living plants or plant parts. The primary consumers are zooplanktons.

Question88

Pyramid of numbers deals with number of (1993)

Options:

A. species in an area

B. individuals in a community

C. individuals in a trophic-level

D. subspecies in a community.

Answer: C

Solution:

Solution:
(c) : Pyramid of numbers is an ecological pyramid which employs the number of individuals per unit area at various trophic levels sequence wise with producers at the base and various consumers at successively higher levels. Pyramid of number assumes different shapes in different ecosystems. The pyramid of number in pond ecosystem is also upright. In forest ecosystem the pyramid of number is intermediate. Here, the number of primary consumers is more than producers as well as top consumers. In parasitic food chain the pyramid of number is inverted.

Question89

Pyramid of numbers in a pond ecosystem is (1993)

Options:

A. irregular

B. inverted

C. upright

D. spindle shaped

Answer: C

Solution:

Solution:
(c) : Pyramid of numbers is an ecological pyramid which employs the number of individuals per unit area at various trophic levels sequence wise with producers at the base and various consumers at successively higher levels. Pyramid of

number assumes different shapes in different ecosystems. The pyramid of number in pond ecosystem is also upright. In forest ecosystem the pyramid of number is intermediate. Here, the number of primary consumers is more than producers as well as top consumers. In parasitic food chain the pyramid of number is inverted.

Question90

Food chain in which microorganisms breakdown the food formed by primary producers is
(1991)

Options:

A. parasitic food chain

B. detritus food chain

C. consumer food chain

D. predator food chain.

Answer: B

Solution:

Solution:
(b) : The dead organic matter of plants or animals is called as detritus. While a part of it remains on the soil surface as litter, the other part enters the soil. Many animals such as protozoans, nematodes, insects etc., depend on detritus and hence they are called as detritivores. Even the human beings are detritivores when they eat cooked food. From detritus, the chain proceeds to detritivores, then to carnivores and finally to top carnivores.

Question91

Pick up the correct food chain.
(1991)

Options:

A. Grass → Chameleon → Insect → Bird

B. Grass → Fox → Rabbit → Bird

C. Phytoplankton → Zooplankton → Fish

D. Fallen leaves → Bacteria → Insect larvae

Answer: C

Solution:

(c) : The process of transfer of energy from producers through a series of organisms, i.e., from primary consumers to secondary consumers and from secondary consumers to tertiary consumers by process of eating and being eaten constitute a food chain. The correct food chain is Phytoplankton → Zooplankton → Fish

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Question92

Pyramid of numbers in a grassland/tree ecosystem is (1991,1990)

Options:

A. always inverted

B. always upright

C. both (a) and (b)

D. spindle-shaped.

Answer: B

Solution:

Solution:
(b) : Pyramid of numbers in a grassland/tree ecosystem is always upright. It shows the number of individual organisms at each level. In a grassland, the producers, which are mainly grasses, are always maximum in number. This number then shows a decrease towards apex, primary consumers are lesser in number than the grasses; the secondary consumers are lesser in number than the primary consumers. Finally, the top consumers are least in number. Thus, the pyramid becomes upright.

Question93

Upper part of sea/aquatic ecosystem contains (1988)

Options:

A. plankton

B. nekton

C. plankton and nekton

D. benthos.

Answer: A

Solution:

(a) : Planktons are passively floating in upper water, nektons are actively swimming while benthos lead sedentary life

upon the sea bottom. Planktons are producers and are present in large number.

Question94

What is true of ecosystem?
(1988)

Options:

A. Primary consumers are least dependent upon producers.

B. Primary consumers out-number producers.

C. Producers are more than primary consumers.

D. Secondary consumers are the largest and most powerful.

Answer: C

Solution:

(c) : An ecosystem may be defined as a structural and functional unit of the biosphere comprising living organisms and their non-living environment that interact by means of food chains and chemical cycles resulting in energy flow, biotic diversity and material cycling to form a stable, self supporting system.
The organisms in an ecosystem are classified into 3 main categories-producers, consumers and decomposers. The consumers utilise materials and energy stored by the producers. Decomposers obtain their food molecules from the organic materials of dead producers and consumers. In a true ecosystem, producers are more than consumers (herbivores and carnivores).

Question95

In an ecosystem, which one shows one-way passage?
(1988)

Options:

A. Free energy

B. Carbon

C. Nitrogen

D. Potassium

Answer: A

Solution:

(a) : The behaviour of energy in ecosystem can be termed energy flow due to unidirectional flow of energy. Flow of energy is only in one direction i.e., from solar radiation → producers → herbivores → carnivores. This energy cannot pass in the reverse direction. There is decrease in the content and flow of energy with rise in trophic level.
