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Chapter 14: Ecosystem

NCERT Exemplar · Class 12 · Biology

Multiple Choice Questions

Question 1

Decomposers like fungi and bacteria are:

- i. autotrophs
- ii. heterotrophs
- iii. saprotrophs
- iv. chemo-autotrophs.

Choose the correct answer:

A.

i and iii,

B.

i and iv

C.

ii and iii,

D.

i and ii

Answer

Correct option: C

Solution

Ans: (c) ii and iii

Question 2

The process of mineralisation by microorganisms helps in the release of:

A.

inorganic nutrients from humus

B.

both organic and inorganic nutrients from detritus

C.

organic nutrients from humus

D.

inorganic nutrients from detritus and formation of humus.

Answer

Correct option: D

Solution

Ans: (d) inorganic nutrients from detritus and formation of humus

Question 3

Productivity is the rate of production of biomass expressed in terms of:

i. $(\text{kcal m}^{-3})\text{yr}^{-1}$

ii. $\text{g}\cdot\text{2yr}^{-1}$

iii. $\text{g}\cdot\text{1yr}^{-1}$

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

A.

ii,

B.

iii,

C.

ii and iv,

D.

i and iii

Answer

Correct option: C

Solution

Ans: (c) ii and iv

Question 4

An inverted pyramid of biomass can be found in which ecosystem?

A.

Forest

B.

Marine

C.

Grassland

D.

Tundra

Answer

Correct option: B

Solution

Ans: (b) Marine

Question 5

Which of the following is not a producer?

A.

Spirogyra

B.

Agaricus

C.

Volvox

D.

Nostoc

Answer

Correct option: B

Solution

Ans: (b) Agaricus

Question 6

Which of the following ecosystems is most productive in terms of net primary production?

A.

Deserts

B.

Tropical rain forests

C.

Oceans

D.

Estuaries

Answer

Correct option: B

Solution

Ans: (b) Tropical rain forests

Question 7

Pyramid of numbers is:

A.

Always upright

B.

Always inverted

C.

Either upright or inverted

D.

Neither upright nor inverted.

Answer

Correct option: C

Solution

Ans: (c) Either upright or inverted

Question 8

Approximately how much of the solar energy that falls on the leaves of a plant is converted to chemical energy by photosynthesis?

A.

Less than 1%

B.

2-10%

C.

30%

D.

50%

Answer

Correct option: B

Solution

Ans: (b) 2-10%

Question 9

Among the following, where do you think the process of decomposition would be the fastest?

A.

Tropical rainforest

B.

Antarctic

C.

Dry arid region

D.

Alpine region

Answer

Correct option: A

Solution

Ans: (a) Tropical rainforest

Question 10

How much of the net primary productivity of a terrestrial ecosystem is eaten and digested by herbivores?

A.

1%

B.

10%

C.

40%

D.

90%

Answer

Correct option: B

Solution

Ans: (b) 10%

Question 11

During the process of ecological succession the changes that take place in communities are:

A.

Orderly and sequential

B.

Random

C.

Very quick

D.

Not influenced by the physical environment.

Answer

Correct option: A

Solution

Ans: (a) Orderly and sequential

Question 12

Climax community is in a state of:

A.

non-equilibrium

B.

equilibrium

C.

disorder

D.

constant change.

Answer

Correct option: B

Solution

Ans: (b) equilibrium

Question 13

Among the following bio-geo-chemical cycles which one does not have losses due to respiration?

A.

Phosphorus

B.

Nitrogen

C.

Sulphur

D.

All of the above

Answer

Correct option: D

Solution

Ans: (d) All of the above

Question 14

The sequence of communities of primary succession in water is:

A.

phytoplankton, sedges, free-floating hydrophytes, rooted hydrophytes, grasses and trees.

B.

phytoplankton, free-floating hydrophytes, rooted hydrophytes, sedges, grasses and trees.

C.

free-floating hydrophytes, sedges, phytoplankton, rooted hydrophytes, grasses and trees.

D.

phytoplankton, rooted submerged hydrophytes, floating hydrophytes, reed swamp, sedges, meadow and trees.

Answer

Correct option: D

Solution

Ans: (d) phytoplankton, rooted submerged hydrophytes, floating hydrophytes, reed swamp, sedges, meadow and trees.

Question 15

The reservoir for the gaseous type of biogeochemical cycle exists in

A.

stratosphere

B.

atmosphere

C.

ionosphere

D.

lithosphere

Answer

Correct option: B

Solution

Ans: (b) atmosphere

Question 16

If the carbon atoms fixed by producers already have passed through three species, the trophic level of the last species would be.

A.

scavenger

B.

tertiary producer

C.

tertiary consumer

D.

secondary consumer

Answer

Correct option: C

Solution

Ans: (c) tertiary consumer

Question 17

Which of the following type of ecosystem is expected in an area where evaporation exceeds precipitation, and mean annual rainfall is below 100mm

A.

Grassland

B.

Shrubby forest

C.

Desert

D.

Mangrove

Answer

Correct option: C

Solution

Ans: (c) Desert

Question 18

The zone at the edge of a lake or ocean which is alternatively exposed to air and immersed in water is called:

A.

Pelagic zone

B.

Benthic zone

C.

Lentic one

D.

Littoral zone

Answer

Correct option: D

Solution

Ans: (d) Littoral zone

Question 19

Edaphic factor refers to:

A.

Water

B.

Soil

C.

Relative humidity

D.

Altitude

Answer

Correct option: B

Solution

Ans: (b) Soil

Question 20

Which of the following is an ecosystem service provided by natural ecosystem?

A.

Cycling of nutrients

B.

Prevention of soil erosion

C.

Pollutant absorption and reduction of the threat of global warming

D.

All of the above

Answer

Correct option: D

Solution

Ans. (d) All of the above

Very Short Answer Questions

Question 1

Name an organism found as a secondary carnivore in an aquatic ecosystem.

Solution

Ans: Shark

Question 2

What does the base tier of the ecological pyramid represent?

Solution

Ans: Producers

Question 3

Under what conditions would a particular stage in the process of succession revert back to an earlier stage?

Solution

Ans: A particular stage in the succession process would revert to an earlier stage in the event of natural or human-induced disruptions.

Question 4

Arrange the following as observed in vertical stratification of a forest:

Grass, Shrubby plants, Teak, Amaranths.

Solution

Ans: Teak → Amaranths → Shrubby plants → Grass

Question 5

Name an omnivore which occurs in both the grazing food chain and the decomposer food chain.

Solution

Ans: Crow

Question 6

Justify the pitcher plant as a producer.

Solution

Ans: Photosynthesis is carried out by the pitcher plant, which contains chlorophyll. It solely eats insects to get nitrogen from them. As a result, the pitcher plant is a producer.

Question 7

Name any two organisms which can occupy more than one trophic level in an ecosystem.

Solution

Ans: Sparrow: When it feeds on grains, it is a primary consumer, but when it eats worms and insects, it becomes a secondary consumer.

Human: When it eats grains and pulses, it is a primary consumer, however when it eats lamb, it is a secondary consumer.

Question 8

In the North East region of India, during the process of jhum cultivation, forests are cleared by burning and left for regrowth after a year of cultivation. How would you explain the regrowth of forests in ecological terms?

Solution

Ans: Forest regeneration is an example of ecological succession in this circumstance. After forest clearing, the conditions become xerarch, which then progresses to mesarch as the forest grows.

Question 9

Climax stage is achieved quickly in secondary succession as compared to primary succession. Why?

Solution

Ans: After primary succession, soil becomes available. It creates perfect conditions for the growth of larger plants. When compared to primary succession, secondary succession occurs more swiftly. Hence, climax is furthermore reached more rapidly.

Question 10

Among bryophytes, lichens and fern, which one is a pioneer species in a xeric succession?

Solution

Ans: Lichens

Question 11

What is the ultimate source of energy for the ecosystems?

Solution

Ans: Sun

Question 12

Is the common edible mushroom an autotroph or a heterotroph?

Solution

Ans: Heterotroph

Question 13

Why are oceans least productive?

Solution

Ans: Solar radiation is scarce in the oceans, particularly in the deep waters. Because of the same reason, oceans are the least productive.

Question 14

Why is the rate of assimilation of energy at the herbivore level called secondary productivity?

Solution

Ans: Secondary productivity refers to the rate at which consumers create new organic matter. Consumers obtain raw resources from producers for this reason, which is facilitated via assimilation. Because of the same reason, the rate of energy assimilation at the herbivore level is referred to as secondary productivity.

Question 15

Why are nutrient cycles in nature called biogeochemical cycles?

Solution

Ans: Nutrients are cycled through both biotic and abiotic components. The term 'bio' refers to biotic elements, whereas 'geo' refers to abiotic elements.

As a result, biogeochemical cycles are used to describe nutrient cycles in nature.

Question 16

Give any two examples of xerarch succession.

Solution

Ans: The two examples of xerarch succession are bare rock and sand.

Question 17

Define self-sustainability.

Solution

Ans: A self-sustainable system is one that is self-sustaining and does not require any external input. The system's ability to sustain itself is known as self-sustainability. Natural Ecosystems are self-sustaining.

Question 18

Given below is a figure of an ecosystem. Answer the following questions.

- i. What type of ecosystem is shown in the figure.**
- ii. Name any plant that is characteristic of such an ecosystem.**

Solution

Ans: Desert ecosystem

Ans: Bushes, acacia, etc.

Question 19

What is common to earthworm, mushroom, soil mites and dung beetle in an ecosystem.

Solution

Ans: They are all referred to as detritivores since they are the major consumers in a detritus food chain.

Short Answer Questions

Question 1

Organisms at a higher trophic level have less energy available. Comment.

Solution

Ans: Only 10% of the total energy ingested by a species at one trophic level is accessible to the organism at the next trophic level, as per the 10% rule. As a result, only 10% of the energy a producer turns into biomass is available to the primary consumer. Likewise, the secondary consumer has access to only 10% of the energy utilised by the first consumer. Due to the similar reason, higher trophic level species have less energy available.

Question 2

The number of trophic levels in an ecosystem are limited. Comment.

Solution

Ans: The number of trophic levels in every ecosystem can reach a maximum of five, in which case the food chain would appear like this:

Producer → Primary Consumer → Secondary Consumer → Tertiary consumer → Quaternary Consumer

Assume that the producer is able to capture 100 units of energy. The producer will use 90 of these units, while the primary consumer will have access to 10 of them. Finally, the quaternary consumer will have access to only 0.001 units, which is an insignificant amount of energy. As a result, no ecosystem can support additional trophic levels.

Question 3

Is an aquarium a complete ecosystem?

Solution

Ans: Aquariums are man-made ecosystems with their own set of constraints. Producers cannot have a limitless supply of inorganic materials in the confined space of an aquarium. A significant number of producers is required to support even a small number of consumers that is not achievable in a tiny aquarium. Food must be provided for the aquarium's fish, and the aquarium must be cleaned on a regular basis. Because an aquarium isn't self-sustaining, it can't be considered a complete ecosystem.

Question 4

What could be the reason for the faster rate of decomposition in the tropics?

Solution

Ans: Decomposition is primarily an oxygen-dependent procedure. This also necessitates the use of ambient temperature and moisture. Decomposition is accelerated when debris is high in nitrogen and water-soluble compounds. Each of these conditions can be found in a tropical climate. As a result, decomposition occurs more quickly in the tropics.

Question 5

Human activities interfere with the carbon cycle. List any two such activities.

Solution

Ans: The two actions that disrupt the carbon cycle are as follows:

- (a) Forest clearing: Less green cover slows carbonification, causing the carbon cycle to be disrupted.
- (b) Burning Fossil Fuels: Burning fossil fuels releases carbon into the atmosphere, increasing the percentage of carbon dioxide in the atmosphere. It also has an impact on the carbon cycle.

Question 6

Flow of energy through various trophic levels in an ecosystem is unidirectional and non-cyclic. Explain.

Solution

Ans: At a specific trophic level, about 90% of the energy ingested by an organism is wasted as heat energy. Just 10% is left over for the organism at the next trophic level. By the time it reaches the highest trophic level, the energy accessible is a miniscule fraction of the energy converted by the producer. As a consequence, energy transmission through various trophic levels is non-cyclic and unidirectional.

Question 7

Apart from plants and animals, microbes form a permanent biotic component in an ecosystem. While plants have been referred to as autotrophs and animals as heterotrophs, what are microbes referred to as? How do the microbes fulfil their energy requirements?

Solution

Ans: Productivity, decomposition, energy flow, and nutrient cycling are all necessary components of any ecosystem. Plants and animals both contribute to productivity. While some microorganisms have a role in productivity, like algae and chemosynthetic bacteria, others, like algae and chemosynthetic bacteria, are autotrophs. Heterotrophic microorganisms make up the majority of the population. Parasitic bacteria get their nourishment from the host they live in. Saprotrophs are a type of microorganism that feeds on other bacteria. They eat detritus and are hence a vital part of the detritus food chain.

Question 8

Poaching of tigers is a burning issue in today's world. What implication would this activity have on the functioning of the ecosystem of which the tigers are an integral part?

Solution

Ans: Tigers are tertiary consumers, which means they are at the top of the forest food chain. The regulation of secondary and primary consumer population growth is aided by a tertiary consumer. If all tigers are eliminated, there will be no animal remaining to manage the herbivore population. Producers will quickly become exhausted as a result of this.

In the absence of producers, herbivores would eventually starve to death. This will completely devastate the ecology.

Question 9

In relation to energy transfer in the ecosystem, explain the statement "10kg of deer's meat is equivalent to 1 kg of lion's flesh".

Solution

Ans: It is known that only 10% of the energy consumed at one trophic level can be used at the next. At the primary consumer level, 10 kg of deer meat equals 10 kg of biomass. 90% of it is absorbed by the deer for its own consumption. The lion will have access to the leftover 10%, or 1 kilogramme. As a result, it is correct to declare that 10 kg of deer meat equals 1 kg of lion meat.

Question 10

Primary productivity varies from ecosystem to ecosystem. Explain?

Solution

Ans: The biomass generated per unit area by photosynthesis over time is referred to as primary productivity. It is the quantity of biomass produced by green trousers in a given habitat in simple terms.

The number of plants differs from one ecosystem to the next. The number of plants in tropical rainforests is higher than in deserts. As a result, primary productivity in tropical rainforests would be substantially higher than in deserts. This demonstrates that primary productivity differs by ecology.

Question 11

Sometimes due to biotic/abiotic factors the climax remains in a particular seral stage (pre climax) without reaching climax. Do you agree with this statement. If yes, give a suitable example.

Solution

Ans: A sere refers to the full succession of communities which shift in a given location (s). All biotic and abiotic elements play an important part in this shift, allowing a community to achieve its climax. If the community's biotic and abiotic conditions are insufficient to support climax, this might stay in a given seral stage without attaining the climax. Table Top Mountain, with its sparse vegetation, is an instance of a community in the seral stage. Just mosses and ferns might be found in the community at the tabletop mountain's peak. In time, this would pave the way for taller plants.

Question 12

What is an incomplete ecosystem? Explain with the help of suitable example.

Solution

Ans: An incomplete ecosystem is the one that is missing certain biotic or abiotic components. An ecology that isn't complete can't be self-sustaining. The aquarium is a nice example of a partially completed ecosystem. Even though there are producers and consumers in the aquarium, there are no decomposers. Due to a shortage of decomposers, the aquarium should be cleaned frequently and maintained regularly.

Question 13

What are the shortcomings of ecological pyramids in the study of Ecosystems?

Solution

Ans: The below are some of the problems with ecological pyramids:

- α. It ignores the fact that the same species might be found in two or more trophic levels.
- β. It is dependent on a simple food chain assumption. A simple food chain, on the other hand, does not occur in nature. It's the natural world's intricate food web.
- χ. The decomposers are not included in the food pyramid. Decomposers, at the second hand, are essential components of the nutrition cycle.

Question 14

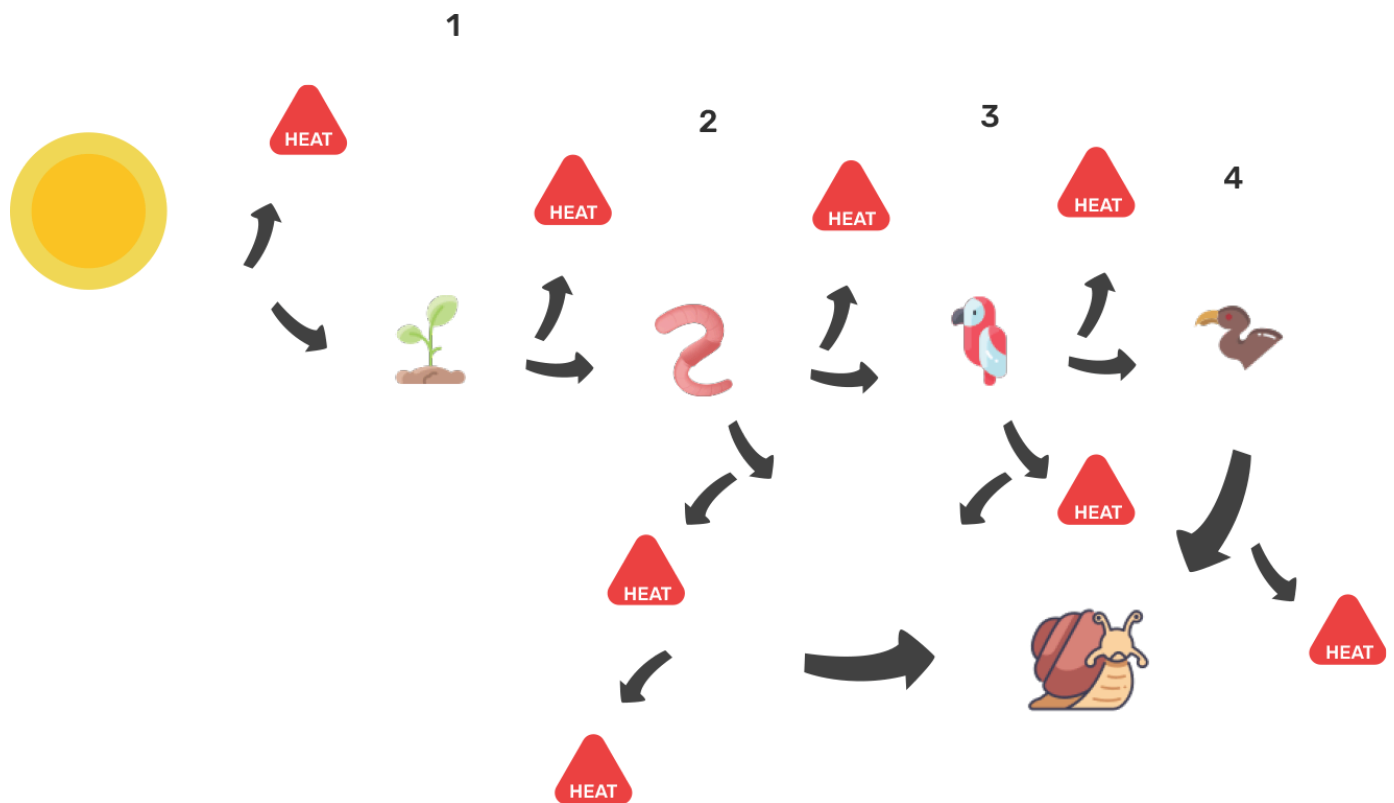
How do you distinguish between humification and mineralisation?

Solution

Ans: The detritus food chain includes both humification and mineralization. Decomposition results in the production of inorganic compounds from organic matter, whereas humification results in the formation of a dark-colored amorphous material termed humus. Mineralisation, unlike humifaction, results in the full breakdown of organic molecules into inorganic compounds.

Question 15

Fill in the trophic levels (1, 2, 3 and 4) in the boxes provided in the figure.



Solution

Ans:

1. Producer,
2. Primary Consumer,
3. Secondary Consumer,
4. Tertiary Consumer.

Question 16

The rate of decomposition of detritus is affected by the abiotic factors like availability of oxygen, pH of the soil substratum, temperature etc. Discuss.

Solution

Ans: Living creatures are responsible for decomposition, albeit the rate of decomposition is regulated by a variety of abiotic variables. Because this is an oxygen-intensive mechanism, the rate of

decomposition is influenced by the supply of oxygen. If there is more oxygen available, decomposition will proceed more quickly. The rate of decomposition is higher in warm weather than in cold weather. pH has an impact on the pace of decomposition. The rate of breakdown in neutral soil is higher than in acidic soil.

Long Answer Questions

Question 1

A farmer harvests his crop and expresses his harvest in three different ways.

- a. I have harvested 10 quintals of wheat.
- b. I have harvested 10 quintals of wheat today in one acre of land.
- c. I have harvested 10 quintals of wheat in one acre of land, 6 months after sowing.

Do the above statements mean one and the same thing? If your answer is yes, give reasons. And if your answer is 'no' explain the meaning of each expression.

Solution

Ans: Different statements imply different things.

The first statement merely reflects the amount of biomass generated, but not the time or region over which it was produced.

The second statement reveals the quantity and area of the product, but not the time it took to make it.

The third statement is complete as it demonstrates the quantity, area and duration.

The third statement's data can be utilised to estimate primary productivity on the farm in terms of biomass produced.

Question 2

Justify the following statement in terms of ecosystem dynamics. "Nature tends to increase the gross primary productivity, while man tends to increase the net primary productivity".

Solution

Ans: The pace at which organic matter is created in an ecosystem is known as gross primary productivity (GPP). We acquire Net Primary Productivity by subtracting respiratory losses (R) from GPP (NPP).

Nature provides a wide range of biotic and abiotic factors that aid in increasing Gross Primary Productivity. As a result, nature has a tendency to boost gross primary productivity.

Humans, on the other hand, must make the best use of the biomass created. This is done in a variety of methods, including harvesting the crop at the right time and picking the fruits at the right time.

Fruits that are kept on the tree for an extended period of time would cause more respiratory losses. NPP will be reduced if there is a higher rate of respiratory loss.

By plucking the fruits at the right time, man aims to boost net primary productivity.

Question 3

Which of the following ecosystems will be more productive in terms of primary productivity? Justify your answer.

A young forest, a natural old forest, a shallow polluted lake, alpine meadow.

Solution

Ans: A young forest might be thought of as a society that has not yet reached its climax. This suggests a decreased tree density in the woodland. Fewer trees are related to poorer primary output. An old forest in the wild might be thought of as a community that has achieved its peak. Tall trees with lush foliage must make up the majority of the vegetation.

As a result, there will be an increase in primary productivity. There may not be many producers in a shallow contaminated lake. Pollution must have had a negative impact on the environment in this pond.

As a result, this pond may have a low primary productivity. An alpine meadow is a grassy area with few or no trees. Primary productivity is lower when there are fewer trees. In light of the foregoing, it is

reasonable to conclude that the natural ancient forest does have the highest degree of primary productivity.

Question 4

What are the three types of ecological pyramids? What information is conveyed by each pyramid with regard to structure, function and energy in the ecosystem?

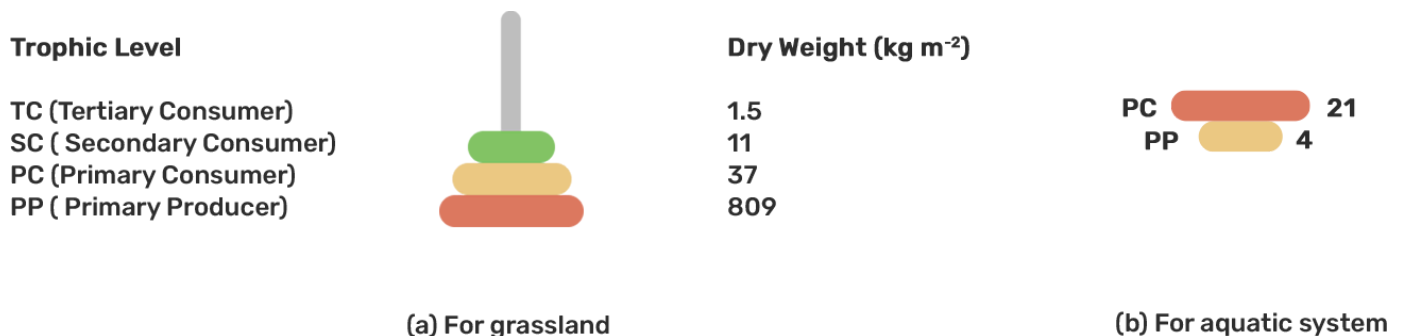
Solution

Ans: Below given are the three types of ecological pyramids:

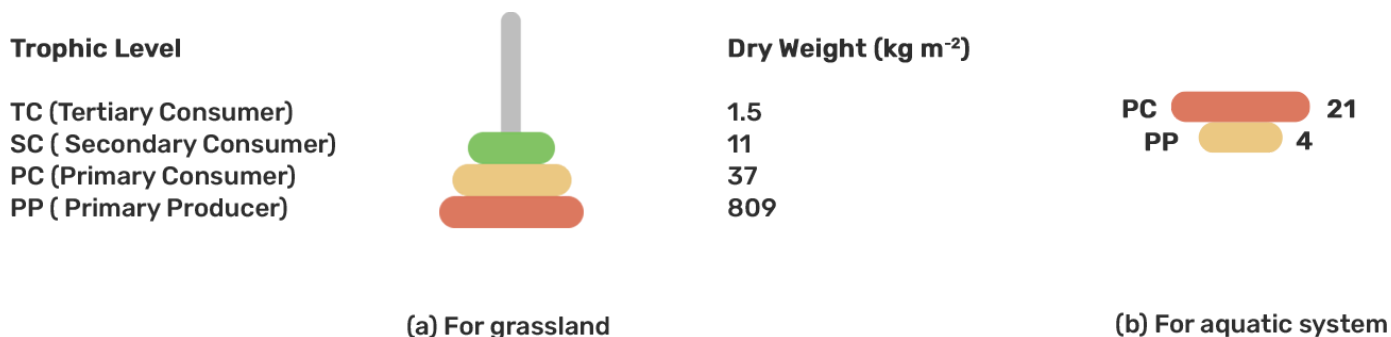
Pyramid of Number: The number of people at different trophic levels is depicted in this pyramid. The bottom of the pyramid is occupied by producers, who are followed by primary consumers, secondary consumers, and so on. In most situations, the pyramid's bottom is substantial. In certain situations, the shape of this pyramid could be inverted.



Pyramid of Biomass: The biomass (in units of dry weight) at different trophic levels is depicted in this pyramid. Producers are at the base of the pyramid, followed by primary consumers, secondary consumers, and so on. In most cases, the pyramid's bottom is substantial. In some situations, the shape of this pyramid could be inverted.



Pyramid of Energy: This pyramid demonstrates energy consumed at a distinct trophic level. The bottom of the pyramid is occupied by producers, who are followed by pyramid consumers, secondary consumers, and so on. In most situations, the shape of the pyramid bottom is heavy. It is impossible for this pyramid to be inverted.



In any type of pyramid, a specific trophic level demonstrates a functional level. A single organism can exist on multiple levels. Flow of energy would always be from prey to predator. The amount and availability of energy varies at different levels, and reduces at subsequent levels.

Question 5

Write a short note on the pyramid of numbers and pyramid of biomass.

Solution

Ans: Pyramid of numbers: A graphical representation of the number of creatures at each trophic level is called a pyramid of numbers. Because the producers are always more numerous than the other trophic levels in an ecosystem, this is an upright pyramid. Charles Elton proposed the pyramid of numbers in 1927. The number of species engaged in each rung of the food chain varies dramatically, as Charles found out. The number of predators at the peak of the trophic structure decreases significantly as the links of the trophic structure progress.

Pyramid of Biomass: A biomass pyramid is a graphical representation of the biomass present in a unit of land at various trophic levels. It also shows the relationship between biomass and trophic level, evaluating the biomass obtainable at any particular time in each trophic degree of an energy network.

The changed biomass pyramid and the upstanding biomass pyramid are the two types of biomass pyramids. In a lake biological system, the mass of phytoplankton, the major producers, would constantly be lower than that of the mass of heterotrophs including fish and creepy crawlies, demonstrating the rearranging pyramid of biomass. The pyramid takes on an odd structure as the biomass estimation grows larger, with tertiary shoppers appearing at the top.

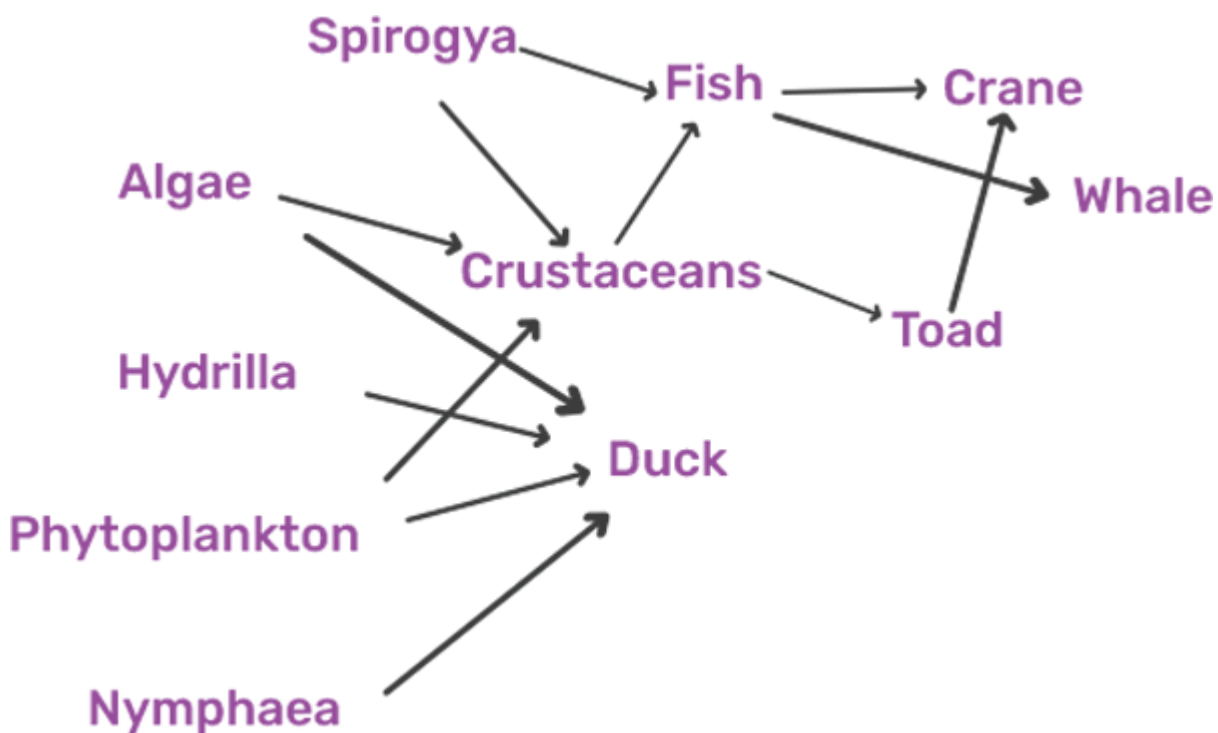
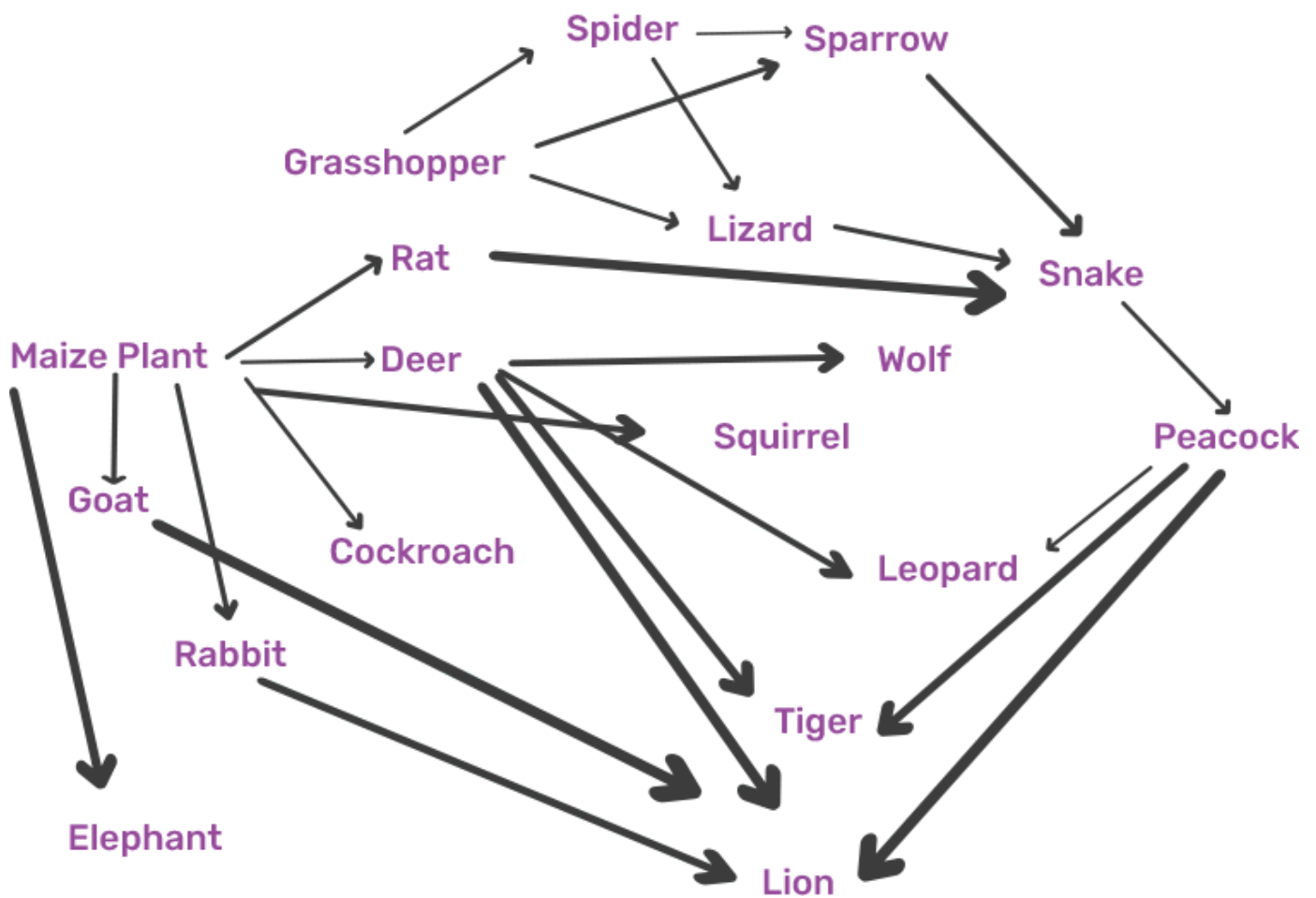
Question 6

Given below is a list of autotrophs and heterotrophs. With your knowledge about the food chain, establish various linkages between the organisms on the principle of 'eating and being eaten'. What is this inter-linkage established known as?

Algae, hydrilla, grasshopper, rat, squirrel, crow, maize plant, deer, rabbit, lizard, wolf, snake, peacock, phytoplankton, crustaceans, whale, tiger, lion, sparrow, duck, crane, cockroach, spider, toad, fish, leopard, elephant, goat, Nymphaea, Spirogyra.

Solution

Ans: The term "food web" refers to the interconnection of many creatures. With the above list of creatures, the following two food webs are possible.



Question 7

“The energy flow in the ecosystem follows the second law of thermodynamics.” Explain.

Solution

Ans: An isolated system's entropy never decreases, according to the second rule of thermodynamics; such a system would reach thermodynamic equilibrium on its own. In thermodynamic equilibrium, the configuration with the highest entropy is used. To synthesise the molecules that an ecosystem requires, it requires a steady supply of energy.

As per the law of thermodynamics, Energy flows in an ecosystem have always been unidirectional since a reverse movement of energy would throw the system out of balance. It has been noticed how producers capture solar energy and act as a conduit for delivering energy to the following trophic levels. Since it is a difficult task to stay in link with the rule of thermodynamics, energy never passes from a higher trophic level to a lower trophic level.

Question 8

What will happen to an ecosystem if:

- a. All producers are removed;**
- b. All organisms of herbivore level are eliminated; and**
- c. All top carnivore population is removed**

Solution

Ans: When all producers are removed from an ecosystem, the primary consumers are left hungry. Because of hunger, all of the primary consumers would perish. This means there would be no food for secondary and tertiary customers, who will be gratified in due course. The ecosystem would come to an end as a result of this.

Ans: If all herbivores are destroyed from an ecosystem, predators will have no food. Due to a scarcity of food, all of the carnivores might eventually starve to death. In the absence of herbivores, plant populations will grow exponentially. However, if there aren't enough other biotic components, the biogeochemical cycle will come to a standstill. This will bring the ecosystem to a close.

Ans: Herbivore populations would explode if all of the top carnivores are destroyed. Due to overgrazing, the survival of green plants would be endangered. The absence of green flora will compel animals to starve to death.

Question 9

Give two examples of artificial or man-made ecosystems. List the salient features by which they differ from natural ecosystems.

Solution

Ans: Two examples of artificial ecosystems are Crop fields and an aquarium.

Natural ecosystems	Man-made ecosystems
(i) Natural ecosystems are the ones that do not involve human intervention.	(i) Man-made ecosystems are the ones that involve human intervention.
(ii) Numerous natural ecosystems are being spanned over huge areas.	(ii) These are the ecosystems which span within a limited area.
(iii) Replenishment of nutrients happens via biogeochemical cycles.	(iii) Replenishment of nutrients is done by humans.
(iv) There is an equilibrium between the producers and consumers population.	(iv) There remains an imbalance in the producers and consumers population.
(v) Natural ecosystems are self-sustaining.	(v) Man-made ecosystems are not self-sustaining.

Question 10

The biodiversity increases when one moves from the pioneer to the climax stage. What could be the explanation?

Solution

Ans: The food availability for customers determines a community's biodiversity. If a community's flora is diverse, this could sustain a wider range of consumer kinds.

The much more typical plants in a pioneer colony include bryophytes, lichens, and pteridophytes. Such plants don't really generate adequate biomass to support a diversified fauna.

As a result, biodiversity would be restricted at this time. Gymnosperms and angiosperms proliferate once the community reaches its peak. The biomass produced by these plants is sufficient to support a diversified fauna. As a consequence, biodiversity is currently expanding.

Question 11

What is a biogeochemical cycle? What is the role of the reservoir in a biogeochemical cycle? Give an example of a sedimentary cycle with a reservoir located in earth's crust.

Solution

Ans: The biogeochemical cycle, often known as nutrient cycling, is the exchange of nutrients between ecosystem elements. Nutrient cycle guarantees that nutrients in the ecosystem are never wasted. They are continually renewed in ecosystem reservoirs.

Reservoir Function: A nutrient could become inadequate when the outflow and influx of that nutrient are out of balance. By supplying nitrogen, the reservoir balances for the nitrogen deficiency.

Phosphorus Cycle: The phosphorus reservoir is found in the earth's crust. A sedimentary cycle is exemplified by the phosphorus cycle. Phosphorus is naturally stored in rocks. Phosphorus is found in the form of phosphates in rocks. During the rock weathering, low concentrations of phosphates mix in

the soil solution. Plant roots absorb phosphorus from the soil solution. Phosphates are supplied by plants to both primary and secondary users.

Question 12

What will be the P/R ratio of a climax community and a pioneer community? What explanation could you offer for the changes seen in P/R ratio of a pioneer community and the climax community?

Solution

Ans: A community's P/R ratio is the proportion of gross output to communal respiration. This could be one, a number less than one, or a number more than one.

In a pioneer town, the P/R ratio can be less than or more than one.

A climax community's P/R ratio, on the other hand, is 1.

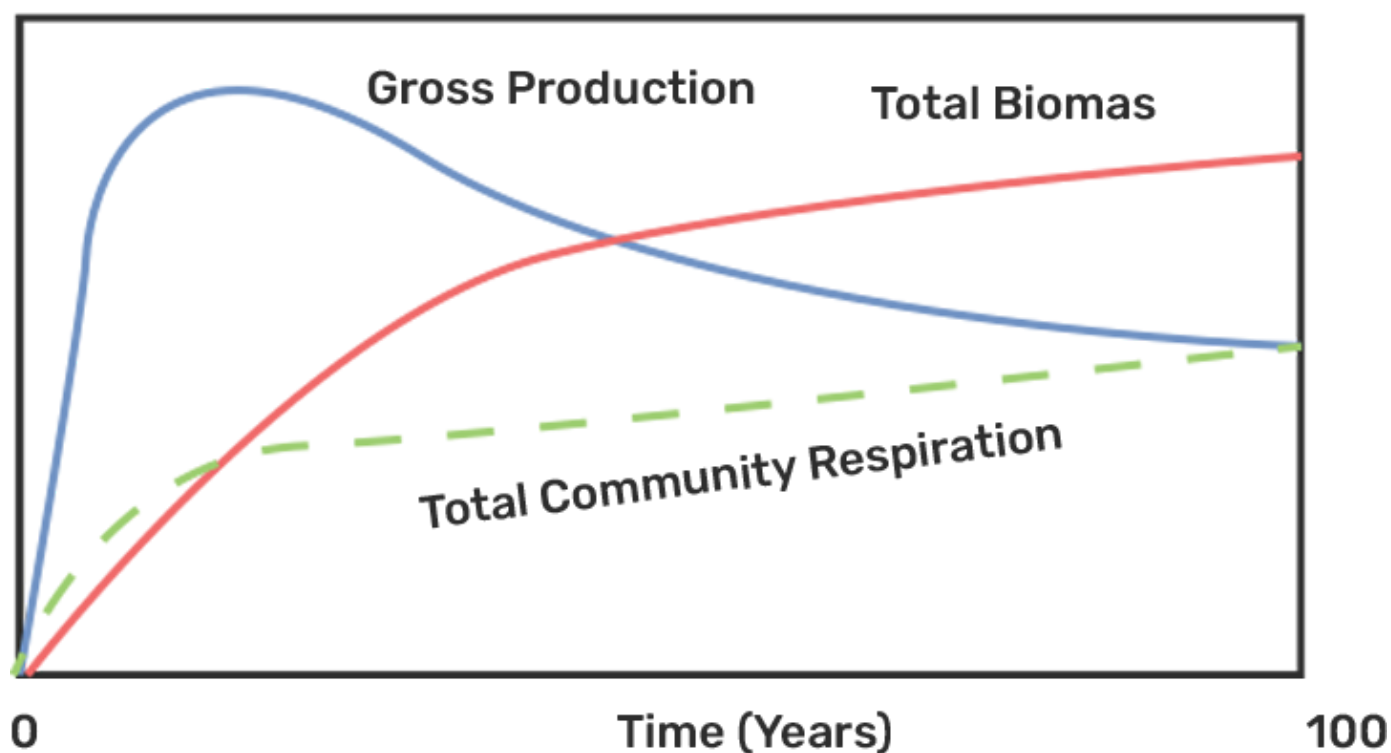
There are two possible scenarios in a pioneer village.

(a) Respiratory loss is minimised when gross output is higher and there are fewer consumers. As a consequence, the P/R ratio will be greater than 1.

(b) When decomposition rates are higher due to a significant decomposer population, gross productivity is poorer than respiratory losses.

The P/R ratio is smaller than one in this scenario.

In the case of the climax community, the P/R ratio is one. As a consequence of the community's stability, this happens. The P/R ratio is depicted in the graph below at various stages of community succession. The primary community is at the top of the diagram, whereas the climax community is at the base.



Benefits of Exemplar Problems for Class 12 Biology

These NCERT Exemplar problems for Class 12 Biology are intended to boost students' knowledge and learning rather than serve as a question bank for exams. These NCERT Exemplar problems for Class 12 Biology are meant to motivate instructors and students to think of good discussion topics. These example books feature high-quality questions based on the most recent CBSE Syllabus for thorough Chapter practice. Every year, exceptional questions are added in CBSE Board Papers to increase exam quality.

The NCERT Biology Exemplar Solution Chapter 14 Ecosystem's principal purpose is to provide instructors and students with a large number of high-quality problems of varied cognitive levels to aid in the teaching-learning of topics in all NCERT solutions for Classes 6 to 12. The questions in these volumes are designed to assist teachers in developing balanced question papers for unit and terminal examinations, as well as preparing assignments, evaluating their teaching effectiveness, and learning about their students' achievements.

Teachers who want to improve the quality of their Classroom instruction could benefit from feedback based on student reactions. Furthermore, the Biology questions are difficult to answer. Exemplar Solutions Chapter 14 Ecosystems are required to assist instructors in comprehending the elements of high-quality questions and encouraging them to create their own. Students may benefit from completing the self-assessment questions in the Exemplar book and understanding the basic problem-solving processes. Some of the book's questions are intended to assess students' grasp of concepts and their ability to apply them in new settings.
