

Ecosystem Chapter 12

Multiple Choice Questions

1. Read the four statements given below and select the option having two correct statements:

- (i) A lion eating a deer and a sparrow feeding on grains are ecologically similar in being consumers.
- (ii) Predator starfish *Pisaster* helps in maintaining species diversity of some invertebrates.
- (iii) Predators ultimately lead to extinction of prey species.
- (iv) Production of chemicals nicotine and strychnine by plants are metabolic disorders.

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

2. Mass of living matter at a trophic level in an area at any time is called

- (a) standing crop. (b) detritus. (c) humus. (d) standing state

3. Identify the possible link "A" in the following food chain. Plant → insect → frog → "A" → eagle

- (a) rabbit. (b) wolf. (c) cobra. (d) parrot

4. Which one of the following is not a functional unit of an ecosystem?

- (a) Energy flow. (b) Decomposition. (c) Productivity. (d) Stratification

5. The upright pyramid of number is absent in

- (a) pond. (b) lake. (c) both (a) and (b). (d) grassland

6. The rate of formation of new organic matter by rabbit in a grassland, is called

- (a) net productivity. (b) secondary productivity
(c) net primary productivity. (d) gross primary productivity

7. Decomposers like fungi and bacteria are

- (i) autotrophs. (ii) heterotrophs. (iii) Saprotrophs. (iv) chemo-autotrophs

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

8. 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.

9. Productivity is the rate of production of biomass expressed in terms of

- (i) $\text{kcal m}^{-3} \text{ yr}^{-1}$. (ii) $\text{g m}^{-2} \text{ yr}^{-1}$. (iii) $\text{g}^{-1} \text{ yr}^{-1}$. (iv) $\text{kcal m}^{-2} \text{ yr}^{-1}$

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

1. © 2. (a). 3. © 4. (d). 5. © 6. (b). 7. © 8. (a). 9. ©

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

(a) Forest. (b) Marine. (c) Grass land. (d) Tundra

11. What is the difference between a community or group of communities and an ecosystem?

(a) A community and the abiotic environment comprise an ecosystem.

(b) An ecosystem is a type of community.

(c) A biome includes only the plant community or communities present in an environment.

(d) An ecosystem includes only the abiotic aspects of a particular environment.

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

(a) Deserts. (b) Tropical rain forests. (c) Oceans. (d) Estuaries

13. Pyramid of numbers is

(a) always upright. (b) always inverted

(c) either upright or inverted. (d) neither upright nor inverted

14. Of the total amount of energy that passes from one trophic level to another, about 10% is

(a) respired and becomes heat. (b) passed out as feces or urine

(c) stored as body tissue. (d) recycled to autotrophs

15. 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

16. Humans benefit from ecosystems because ecosystems provide

(a) buffers from natural disasters such as floods.

(b) maintenance of a clean water supply.

(c) climate moderation.

(d) All of the above

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

(a) Grassland. (b) Shrubby forest. (c) Desert. (d) Mangrove

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

19. Edaphic factor refers to:

(a) water. (b) soil. (c) relative humidity. (d) altitude

Answers

10. (b). 11. (a). 12 (b). 13. © 14. © 15. ©
16. (d). 17. © 18. (d). 19. b

Assertion-Reason Questions

In the following questions a statement of assertion followed by a statement of reason is given. Choose the correct one out of the following choices.

- a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
- b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
- c) Assertion is correct statement but reason is wrong statement.
- d) Assertion is wrong statement but reason is correct statement.

1. Assertion : Some aquatic ecosystems have inverted biomass pyramids.

Reason : More energy is required by the organisms occupying higher trophic levels.

2. Assertion : A network of food chains existing together in an ecosystem is known as a food web.

Reason : An animal like kite cannot be part of a food web.

3. Assertion : In open water zone upto the depth to which light can penetrate is called photic zone.

Reason : The photic zone contains autotrophs.

4. Assertion : In a food chain the members of the successive trophic levels are fewer.

Reason : Number of organisms at any trophic level is independent of the availability of organisms which serve as food at the lower level.

5. Assertion : Vertical distribution of different species occupying different levels is called stratification.

Reason : Trees occupy top vertical strata, shrub the second, herbs and grasses occupy the bottom layers.

6. Assertion : Pyramid of energy is always upright.

Reason : When energy flows from a particular trophic level to the next trophic level, some energy is always lost as heat at each step.

7. Assertion: The decomposers feed on detritus, or decaying organic matter, derived from all levels.

Reason : At each level of energy flow in the food web, energy is lost to respiration.

8. Assertion: In a terrestrial ecosystem, detritus food chain is the major conduit for energy flow.
Reason : Solar energy is the direct source for energy supply in a detritus food chain.

9. Assertion: Net primary productivity is gross primary productivity minus respiration.

Reason : Secondary productivity is produced by heterotrophs.

Answers

1. (b). 2. © 3. (b). 4. (d). 5. (a). 6 (a). 7. (b). 8. © 9. (b)

PASSAGE-1

Ecosystem consists of biotic and abiotic components which are interacting with each other to maintain stability in the ecosystem. They are interacting with each other through food chain which consists of linear arrangement of different species involving transfer of food energy from plants called producers to consumer levels. There are various trophic level in food chain depicting functional role of the species.

(1) Define trophic level.

(ii) Write the direction of flow of energy in a food chain?

(iii) Which law describes the flow of energy to successive trophic level and what states that?

OR

(iii) Why are there usually 4 or 5 trophic levels in the food chain? Explain.

Answers

(i) In an ecosystem, an organism occupies a specific place in the food chain called trophic level.

(ii) Unidirectional flow of energy from producers to the consumer.

(iii) Lindeman's 10 per cent law describes the flow of energy to successive trophic level.

It states that at each step of food chain, when food energy is transferred from one trophic level to the next trophic level, only about 10 per cent of energy is passed on to the next trophic level.

OR

(iii) There are usually 4 or 5 trophic levels in the food chain because only 10% of energy is transferred from one trophic level to the next trophic level and most of the energy is lost in the form of respiration and others vital activities to maintain life. If more trophic levels are present the residual energy will be limited and decreased to such an extent that it cannot further support any trophic level by the flow of energy.