Solution

CET25B12 ECOSYSTEM

Class 12 - Biology

1.

(b) Biosphere

Explanation: The zone of the earth occupied by the living organism is called the biosphere. It includes lands, water, and air where living organisms survive.

2.

(b) Respiration

Explanation: Respiration causes a reduction in the gross primary productivity of an ecosystem.
Gross primary productivity – Respiration = Net primary productivity.

3.

(b) $gm^{-2}yr^{-1}$

Explanation: Primary productivity expressed as $gm^{-2}yr^{-1}$

4.

(d) Littoral

Explanation: Littoral

5. **(a)** Herbivores

Explanation: Plants and algae make their own food and are called primary producers. Herbivores eat plants and are called primary consumers.

6. **(a)** Decreases at each higher trophic level

Explanation: Energy decreases as it moves up trophic levels because energy is lost as metabolic heat when the organisms from one trophic level are consumed by organisms from the next level.
Trophic level transfer efficiency (TLTE) measures the amount of energy that is transferred between trophic levels.

7. **(a)** Herbivores

Explanation: Herbivores

8.

(c) both 1^{o} consumer and 2^{o} consumer

Explanation: Sparrow feeds on fruits as well as insects. Herbivores or plant-eaters are primary consumers and carnivores that feed on herbivores are secondary consumers. So, Sparrow occupies both primary and secondary trophic levels.

9.

(c) 1.5 kg/m^2

Explanation: 1.5 kg/m^2

10.

(c) Desert

Explanation: In the Desert ecosystem, the rate of evaporation is higher than rate of precipitation and the annual rainfall is below 100mm.

11. **(a)** Eutrophic

Explanation: Eutrophic

12.

(d) Biomes

Explanation: Biomes

13.

(b) Desert

Explanation: Desert

14.

(c) Ocean

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Explanation: Ocean

15.

(b) 10%
Explanation: According to 10 percent law – only 10 percent of the energy is transferred to each trophic level from the lower trophic level.

16.

(d) Scavengers
Explanation: Scavengers

17.

(c) Phytoplanktons
Explanation: Phytoplanktons

18.

(c) Decomposers
Explanation: Decomposers include micro-organisms such as bacteria and fungi. They form the largest population in a food chain and obtain nutrients by breaking down the remains of dead plants and animals.

19.

(d) 50%
Explanation: Photosynthetically Active Radiation (PAR) is the light wavelength range that is best fit for photosynthesis to occur. Photosynthesis is a process that requires light energy and optimally occurs in the 400 to 700 nanometer (nm) range 1. This range is also known as visible light. It is approx. 50% of incident solar radiation.

20.

(b) Detritus is rich in lignin and chitin.
Explanation: Detritus is rich in lignin and chitin.

21.

(d) 10%
Explanation: 10%

22.

(d) Micro-organisms
Explanation: Micro-organisms

23.

(b) Insects
Explanation: Insects like grasshoppers feed upon the producers (i.g. grasses) and are eaten by primary carnivores (e.g. frogs).

24.

(b) River
Explanation: River

25.

(b) Secondary consumers
Explanation: Secondary consumers

26.

(b) Photosynthesis
Explanation: Photosynthesis

27.

(c) Interchange between producers and consumers
Explanation: Interchange between producers and consumers

28. **(a)** Pyramid of energy
Explanation: Pyramid of energy

29.

(b) Population, pollution and ecological imbalance will rise.

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Explanation: If we remove half of the forest covers of earth the crisis that will occur are Population, pollution, and ecological imbalance will rise as forest act as nature provides ecological services.

30.

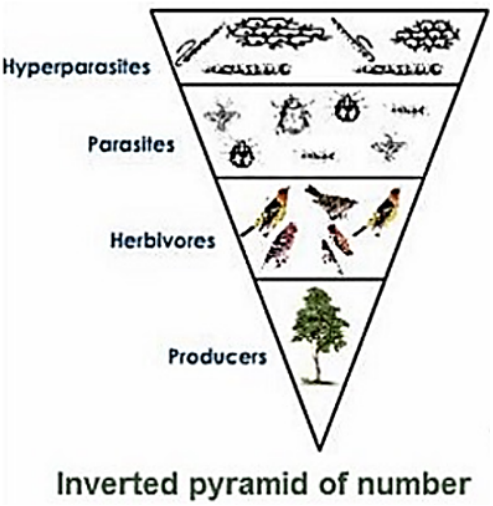
(b) Lichens and mosses

Explanation: The Arctic consists of desert and tundra vegetation. The desert vegetation consists of algae, lichens, and mosses. Lichens are the most dominant plants. The ground is bare with a patchy cover of lichens and mosses.

31.

(d) An inverted pyramid of number

Explanation: Inverted Pyramid of Number is a type of ecological pyramid seen in the parasitic food chain where one primary producer supports numerous parasites that support more hyperparasites.



32.

(c) Wolf

Explanation: Wolf

33.

(c) Net primary productivity, gross primary productivity.

Explanation: Net primary productivity, gross primary productivity.

34. **(a)** Phytoplanktons

Explanation: In a pond ecosystem, the food chain starts with Phytoplanktons.

35. **(a)** Economic, environmental and aesthetic goods and services.

Explanation: Healthy ecosystems are the base for a wide range of economic,environmental and aesthetic goods and services. The products ofecosystem processes are named as ecosystem services, for example,healthy forest ecosystems purify air and water, mitigate droughts andfloods, cycle nutrients, generate fertile soils, provide wildlife habitat,maintain biodiversity, pollinate crops, provide storage site for carbonand also provide aesthetic, cultural and spiritual values.

36.

(b) Elton

Explanation: Elton

37.

(b) Littoral zone

Explanation: The littoral zone is the zone at the edge of a lake or ocean or in aquatic habitat which is alternatively exposed to air, hence, light is also available and immersed in water.

38.

(c) Stratification

Explanation: An ecosystem is a community of living organisms in conjunction with the nonliving components of their environment (things like air, water, and mineral soil), interacting as a system.

These biotic and abiotic components are regarded as linked together through nutrient cycles and energy flows.

Stratification in the field of ecology refers to the vertical layering of habitat; the arrangement of vegetation in layers. It is not a component of the ecosystem.

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39.

(d) Producers

Explanation: Producers

40.

(d) Decomposers

Explanation: Decomposers

41.

(d) net primary productivity

Explanation: Net Primary Productivity (NPP) is the amount of carbon uptake after subtracting Plant Respiration (RES) from Gross Primary Productivity (GPP). GPP is the total rate at which the ecosystem capture and store carbon as plant biomass, for a given length of time. NPP = GPP – RES.

42.

(c) Green plants

Explanation: Transducers are those organisms that convert one form of energy into another form. Green plants convert solar energy into chemical energy in foods by the process of photosynthesis.

43.

(c) Free floating micro-algae, cyanobacteria and nanoplanktons.

Explanation: Free floating micro-algae, cyanobacteria and nanoplanktons.

44.

(b) Both of these

Explanation: Both of these

45. **(a)** Always upright

Explanation: Always upright

46.

(c) Food chain

Explanation: Food chain

47.

(b) Energy transfer from lower trophic level to higher trophic level.

Explanation: Energy transfer from lower trophic level to higher trophic level.

48.

(d) Movement of energy is unidirectional

Explanation: Movement of energy is unidirectional

49.

(d) Biome

Explanation: Biome

50.

(d) ii and iv

Explanation: The rate of biomass production is called productivity. It is expressed in terms of $gm^{-2}\ yr^{-1}$ or $(kcal\ m^{-2})\ yr^{-1}$ to compare the productivity of different ecosystems.

51.

(c) Total living material

Explanation: Total living material

52. **(a)** Agaricus

Explanation: Agaricus is a fungus which grows on dead and decaying material.

53.

(c) Producers and detritivores

Explanation: Producers and detritivores

54. **(a)** Inverted pyramid of biomass

Explanation: Inverted pyramid of biomass

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55.

(c) Sunlight
Explanation: Sunlight

56. **(a)** Producers & decomposers
Explanation: Producers & decomposers

57. **(a)** Forest
Explanation: Forest

58.

(c) Inverted
Explanation: Inverted

59.

(b) Water
Explanation: Primary productivity is of plants depends upon the availability of water, sunlight, chlorophyll, carbon dioxide, etc. but in desert plants, water is the main limiting factor as very less amount of water is available to plants in deserts.

60.

(c) Food web
Explanation: Food web

61.

(b) Litter
Explanation: Dead parts of plants and animals that fall on earth surface constitute litter. These litter gets decomposed due to the action of microbes to form humus and release nutrients in the soil.

62.

(d) Soil
Explanation: An edaphic factor is an abiotic factor relating to the physical or chemical composition of the soil found in a particular area.

63.

(d) Primary consumers
Explanation: Primary consumers

64. **(a)** Secondary producers
Explanation: Secondary producer

65.

(d) Tropical rain forest
Explanation: Tropical rain forest

66.

(c) Unidirectional
Explanation: Unidirectional

67.

(b) Number
Explanation: Number

68. **(a)** Sea
Explanation: Sea

69.

(d) 1%
Explanation: 1%

70.

(c) Tree and sea ecosystem
Explanation: Tree and sea ecosystem

71. **(a)** 10%
Explanation: 10%

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72. **(a)** Goat
Explanation: Goat

73. **(b)** Grass ⟶ Grasshopper ⟶ Frog ⟶ Snake ⟶ Eagle
Explanation: Grass ⟶ Grasshopper ⟶ Frog ⟶ Snake ⟶ Eagle

74. **(a)** Always upright
Explanation: Always upright

75. **(a)** only in one direction
Explanation: In the ecosystem, the flow of energy takes place in only one direction. The flow of energy takes place from producers to final consumers. The energy present in one trophic level never returns back to the producer.

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