BIOLOGY

BOOKS - NEW JYOTHI BIOLOGY (TAMIL ENGLISH)

ECOSYSTEM

Solutions To Ncert Exercises Fill In The Blanks

1. Plants are called as _____ because they fix carbon dioxide.

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2. In an ecosystem dominated by trees, the pyramid (of numbers) is _____ type.

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3. In aquatic ecosystems, the limiting factor for the productivity is _____.

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4. Common detritivores in our ecosystem are _____ .

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5. The major reservoir of carbon on earth is _____ .

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Solutions To Ncert Exercises

1. Which one of the following has the largest population in a food chain ?

A. Producers

B. Primary consumers

C. Secondary consumers

D. Decomposers

Answer: D

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2. The second trophic level in a lake is

A. phytoplankton

B. zooplankton

C. benthos

D. fishes

Answer: B

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3. Secondary producers are

A. herbivores

B. producers

C. carnivores

D. None of the above

Answer: D

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4. What is the percentage of photosynthetically active radiation (PAR), in incident solar radiation ?

A. $100\ \%$

B. $50\ \%$

C. $1 - 5\ \%$

D. $2 - 10\%$

Answer: B

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5. Distinguish between

a. Grazing food chain and detritus food chain

b. Production and decomposition

c. Upright and inverted pyramid

d. Food chain and Food web

e. Litter and detritus

f. Primary and secondary productivity

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6. Describe the components of an ecosystem.

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7. Define ecological pyramids and describe with examples, pyramids of number and biomass.

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8. What is primary productivity ? Give a brief description of the factors that affect primary productivity .

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9. Define decomposition and describe the processes and products of decoposition .

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10. Give an account of energy flow in an ecosystem .

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11. Write the important features of a sedimentary cycle in an ecosystem .

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12. Outline the salients features of carbon cycling in an ecosystem .

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New Evaluation Type Questions

1. Mention the technical term for expressing an animal's place of living in a biotic environment and its functional relationship with other organisms in an ecosystem .

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2. By observing the relationship between the first pair , write the missing word .

a. Plants : Producers :: Animals :.....

b. Food chain : food web :: Ecosystem :.....

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3. In a particular climatic condition, which components of detritus determines its

a. slower decomposition

b. quicker decomposition ?

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4. Break down of complex organic matter into inorganic substances by decomposers is called decomposition . Some terms related to decomposition are given .

Detritus , detritiv ores , fragmentation , leaching , catabolism , humification, mineralisation .

Explain the above terms to give an outline of decomposition process.

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5. Lindeman proposed law of 10% . How will you explain this law in relation to food chain ?

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6. The number of individuals in an ecosystem is given . Construct the pyramid of number and energy .

Producer -1, Herbivores - 50, Carnivores - 75

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7. The mean net productivity of two biomes are given. Analyse them and answer the following questions.

Tropical rain forest - 450 kg/ sq. km

Desert - 15 kg/sq. km

a. Why does the productivity of deserts become less than that of tropical rain forest ?

b. From the above data analyse the importance of plants in the existence of life.

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8. Consider a pond ecosystem.

a. Draw a pyramid of energy in that ecosystem.

b. Compare three types of pyramidal relationship found among the organisms in pond ecosystem.

c. Is there any difference between nutrient flow and energy flow in an ecosystem ? Substantiate.

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9. Observe the figures given below and answer the following questions.

a. Identify the ecological concept converged through the given figures.

b. Name the group of organisms coming as pioneer

community in this ecological process.

c. Given any two characteristic features of climax community.

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10. Distinguish between standing crop and standing state.

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11. The products of ecosystem processes are named as ecosystem services. Give any five services of ecosystem.

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12. The climax community of every succession is not isolated with one or two species of organisms.' Justify.

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Questions From Edumate

1. Certain data related to number of individuals of two ecosystems are given below.

a. Construct the ecological pyramids of two ecosystems.

b. Name the type of ecosystem I and II.

c. What will be the nature of pyramid of energy in these two ecosystems ?

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2. Analyse the given scheme and answer the questions.

$$\text{Incident solar radiation} - 100\,\%$$
$$\downarrow$$
$$\text{Photosynthetically Active Radiation (PAR)} - 50\,\%$$
$$\downarrow$$
$$\text{Net primary productivity} - 0.8\,\% \; - 4\,\%$$

a. 50% of solar radiation is available for photosynthesis. Evaluate.

b. Net primary productivity is only $0.8 - 4\,\%$. Justify.

c. Can you suggest a remedial measure to increase the primary productivity ?

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3. Table given below show the mean net primary productivity of certain biomes. Analyse the table and answer the following questions.

a. Tropical rain forest is less productive than tropical deciduous forest. Evaluate.

b. Why does the desert biome become less productive ?

c. Life never exists without plants. Justify.

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4. Observe the schematic diagram of nitrogen cycle given below and answer the following.

a. Nitrogen forms vital compounds in plants and animals.

Give an example.

b. Name the microorganism involved in the conversion processes marked as A_1 and A_2 in given figure.

c. Name the physical phenomenon taking place in B region of figure.

d. Suggest possible ways to farmers to supply ecofriendly N_2 nutrients for the enrichment of soil fertility.

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5. Some of the distinguishing characters of different forest biomes are given below. Write the distinguishing characters in the appropriate column of the given table.

Characters

• Evergreen cone - shaped canopy

• Soil richer in nutrients

• Least developed herbaceous layer

• Umbrella like canopy.

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6. through a food chain and answer the following.

a. Which form of solar radiation is trapped as energy ?

b. Which form of energy is utilised by the consumers ?

c. Human beings are the privileged consumers. Justify.

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Questions From Previous Hse

1. The graph shown below relates the mean net primary productivity of certain biomes. Analyse it and answer the following.

a. What do you mean by Net Primary Productivity ?

b. How does the mean primary productivity of aquatic biome differ from that of a tropical rain forest ? Why ?

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2. Construct an ecological pyramid showing the flow of energy based on the given data.

What is the nature of the pyramid ? Why is it so ?

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3. Construct an ecological pyramid indicating the number of organisms at each trophic level with the following organisms.

Snake, Frog, Grass, Peacock, Grasshopper

How this pyramid differs from that of a large tree acting as an ecosystem ?

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4. Figure shown a food web for a pond ecosystem. Observe the chart.

a. Pick out an example of a primary consumer from the given

food web.

b. Draw a food chain for this pond.

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5. "Most of the existing communities are evolved through a series of intermediate stages."

a. Substantiate the above statement with the process involved in the above phenomenon.

b. Name the type of community development in bare rock and flooded area where the communities were destoryed.

c. Elucidate the dynamic changes that happen in a water body.

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6. Answer whether the following statements are true of false :

a. An ecological pyramid represents the species structure of a biotic community.

b. A number pyramid or biomass pyramid can be either vertical or inverted, but an energy pyramid is always vertical obeying the principles of thermodynamics.

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7. The following diagram represents part of a biogeochemical cycle. Identify the biogeochemical cycle.

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8. During a study tour teacher showed the primary colonisers on the banks of the river 'Nila'.

a. Identify the succession and justify your answer.

b. List the different stages of the identified succession.

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9. While learning trophic levels in class-room, teacher asked you to explain 'standing crop' to Raman. Explain.

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10. Pond is a self-sustainable unit. Some organisms related to pond ecosystem are listend below

tadpole, fish, water plants, kingfisher

a. Construct a food chain with the listed organisms.

b. Explain trophic level.

c. Point out trophic level of each organism in the constructed food chain.

d. Name interconnection of food chains in nature.

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Previous Entrance Exam Corner

1. The plains characterised by snow, ice and frozen soil during most of the year are known as

A. tundra

B. chapparal

C. desert

D. taiga

Answer: A

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2. The grasslands in Asia are known as

A. steppes

B. veldt

C. pampas

D. prairies

Answer: A

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3. Which one of the following is the sedimentary cycle ?

A. Oxygen cycle

B. Nitrogen cycle

C. Hydrogen cycle

D. Phosphorus cycle

Answer: D

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4. The rate of convertion of light energy into chemical energy of organic molecules in an ecosystem is

A. Net Primary Productivity

B. Gross Primary Productivity

C. Net Secondary Productivity

D. Gross Secondary Productivity

Answer: B

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5. Choose the correct combination of labelling of the zones in water in a lake.

A. a-Limnetic zone, b - Profundal zone, c - Littoral zone, d - Benthic zone

B. a - Littoral zone, b - Benthic zone, c - Profundal zone, d - Limnetic zone

C. a - Littoral zone, b - Limmetic zone, c - Profundal zone, d - Benthic zone

D. a - Limnetic zone, b - Littoral zone, c - Benthic zone, d - Profundal zone

Answer: C

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6. In a pyramid of numbers, in a grassland ecosystem, the largest population is that of

A. Producers

B. tertiary consumers

C. Secondary consumers

D. primary consumers

Answer: A

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7. Choose the wrong pair.

A. Salvodora - Desert

B. Cenchrus - Savanna

C. Abies - Coniferous forest

D. Tectona - Temperate forest

Answer: D

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8. Which one of the following regarding ecological pyramid is not correct ?

A. In most ecosystems, the pyramid of numbers and biomass are upright

B. In tree-dominated ecosystem the pyramid of numbers is inverted

C. The pyramid of energy expresses mainly the rate of food production

D. In deep water ecosystem, the pyramid of biomass is upright

Answer: D

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9. Match coloum I (Indian forest types) with column II (Dominant tree genera) and choose the correct option

Column I	Column II
a. Tropical rain forest	i. Hopea
b. Tropical deciduous forest	ii. Shorea
c. Temperate broad leaf forest	iii. Quercus
d. Temperate coniferous forest	iv. Pices

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

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

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

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

Answer: A

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10. Select the formula for ecological efficiency

A. $\frac{\text{Gross primary productivity} \times 100}{\text{Incident total solar radiation}}$

B. $\frac{\text{Food energy assimilated} \times 100}{\text{Food energy ingested}}$

C. $\frac{\text{Net primary productivity} \times 100}{\text{Gross primary productivity}}$

D. $\frac{\text{Energy in biomass production at a trophic level} \times 100}{\text{Energy in biomass production at previous trophic level}}$

Answer: D

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11. Some of the nutrient cycle are labelled as below.

Sulphur cycle (i), phosphorus cycle (ii), carbon cycle (iii) and nitrogen cycle (iv) of these, the sedimentrary cycle is represented by

A. (i) only

B. (ii) only

C. (iii) only

D. (i) and (ii) only

Answer: D

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12. Which of the following is false ?

A. Quantity of biomass in a trophic level at a particular period is called as standing crop.

B. The energy content in a trophic level is determined by considering a few individuals of a species in that trophic level.

C. The sucession that occurs in newly cooled lava is called primary succession.

D. Rate of succession is factor in secondary succession.

Answer: B

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13. Which of the following statements regarding decomposition is false ?

A. Warm and most environment favour decomposition

B. Decomposition rate is slower if detritus is rich in chitin and lignin

C. Earthworm is a detritivore

D. Precipitation of soluble inorganic nutrients into the soil horizon as unavailable salts is called mineralisation

Answer: D

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Cbse Corner

1. Cite an example of an inverted ecological pyramid. What kind of pyramid of energy would it have ?

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2. When is the structure and composition of a community expected to remain unchanged ?

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Continuous Evaluation Project

1. Study the different seral communities present in different ponds of your locality.

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2. Visit a grassland ecosystem and list out the plants.

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