



# BIOLOGY

## BOOKS - CENGAGE BIOLOGY

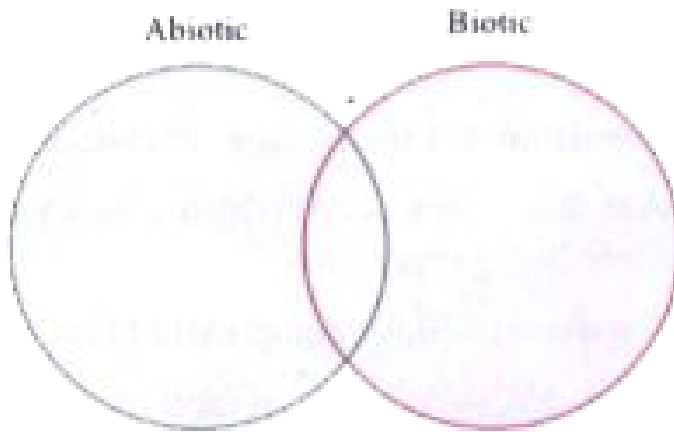
### ENVIRONMENT AND ITS COMPONENTS

#### Mandatory Exercise Exercise Set I

1. List the biotic and abiotic factors in the Venn diagram. Do not enter any list items into the

intersection at this point .

Whale cloud sand gold grapes air fish  
snail lake aluminium grasshopper sun lava  
salt (NaCl) pebble



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2. Match column A with column B :

Column A	Column B
(i) Biotic	(p) all the living components in one area
(ii) Abiotic	(q) refers to living things
(iii) Environment	(r) all the non-living components in an area
(iv) Biotic factors	(s) refers to non-living things
(v) Abiotic factors	(t) all living and non-living things in an area



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3. The solid outer portion of the earth containing soil and rock is called \_\_\_\_\_.



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4. Describe the structure of biosphere .



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5. In what ways does each biome differ from the other biomes ?



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6. A rat feeding on potato tuber is a

A. Producer

B. Primary consumer

C. carnivore

D. decomposer

**Answer: B**



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**7. Match the items of column A with those of column B :**

Column A

Column B

- |                  |                         |
|------------------|-------------------------|
| (i) Grass        | (p) Decomposer          |
| (ii) Grasshopper | (q) Secondary carnivore |
| (iii) Frog       | (r) Producer            |
| (iv) Hawk        | (s) Primary consumer    |
|                  | (t) Primary carnivore   |



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8. If we completely remove the decomposers from an ecosystem, its functioning will be adversely affected, because

A. herbivores will not receive solar energy

B. mineral movement will be blocked

C. the rate of decomposition will be very high

D. energy flow will be blocked

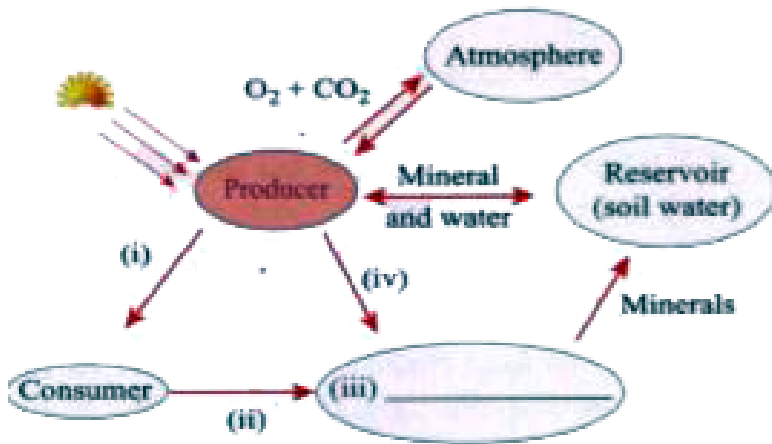
**Answer: B**



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**Mandatory Exercise Exercise Set II**

1. Identify (i)-(iv) in the figure below:



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2. Flow of energy in the biosphere is \_\_\_\_\_.

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**3.** This question consists of two statements each assertion (A) and reason (R). To answer this question, mark the correct alternative as directed below.

Assertion: The pyramid of number of pond ecosystem is upright. Reason: Phytoplankton are maximum in number and secondary consumers are least in number.

A. If both A and R are true, and R' is the correct explanation of A

B. If both A and Rare true, but R is not the correct explanation of A

C. If A is true but R is false

D. If both A and Rare false

**Answer: A**

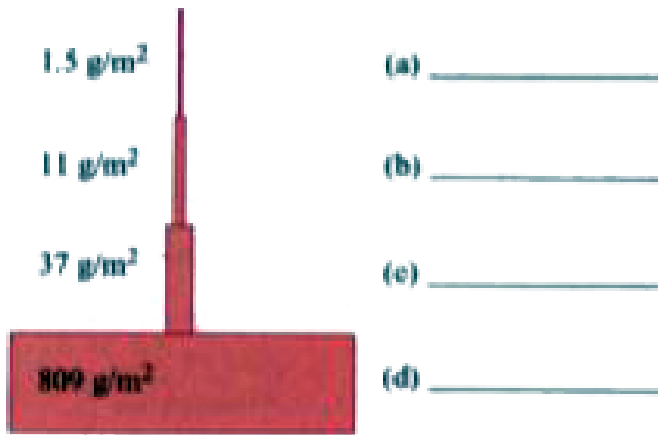


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4. In the following diagram, label the trophic levels, using two of these terms for each level:

producer, top carnivores, secondary

consumers, autotrophs, primary consumers, tertiary consumers, carnivores, herbivores.



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5. What will happen if you kill all the organisms of one trophic level?

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6. Can the organisms of any trophic level be removed without causing any damage to the ecosystem ? Will the impact of removing all the organisms in a trophic level be different for different trophic levels ?



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7. What is biological magnification? Will the levels of this magnification be different at different levels of the ecosystem?



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8. Select the mismatched pair in the following and correct it.

A. Aquarium - A man-made ecosystem

B. Parasites - Organisms which obtain food  
from other living organisms

C. Ecosystem - Biotic component of  
environment

D. Food chain - Transfer of food energy from the producers through a series of organisms with repeated eating and being eaten .

**Answer:**



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**9.** Suggest one word for each of the following statements/definitions:

- A. The physical and biological world where we live in.
- B. Each level of food chain where transfer of energy takes place.
- C. Physical factors such as temperature, rainfall, and wind of an ecosystem.
- D. Interlocking pattern of a number of food chains.

**Answer:**



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## Consolidate Exercise

1. Why are crop fields known as artificial ecosystem?

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2. \_\_\_\_\_

(a) The diagram above represents a \_\_\_\_\_ .



(b) The caterpillar occupies position of \_\_\_\_\_  
and \_\_\_\_\_ level consumer.

(c) The robin occupies the position of \_\_\_\_\_  
and \_\_\_\_\_ level of consumer.

(d) If the tree can provide 100,000 calories of  
energy , approximately \_\_\_\_\_calories of  
energy will be available to the robins and  
\_\_\_\_\_calories will be available to the house  
cat.



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3. There is some sort of relationship between the number, biomass, and energy contents of the producers and consumers of different orders in any ecosystem. These relationships, when represented in diagrammatic ways, are known as ecological pyramids.

Observe the ecological pyramid given here and analyse. Whether it is upright or inverted for pyramid of.

(a) energy\_\_\_\_\_

(b) biomass\_\_\_\_\_

(c) numbers\_\_\_\_\_



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Organism



Population



Community



Ecosystem

4.

A Ecosystem

B Habitat

C Community

D Population Choose the most appropriate vocabulary term from the list above and answer the following:

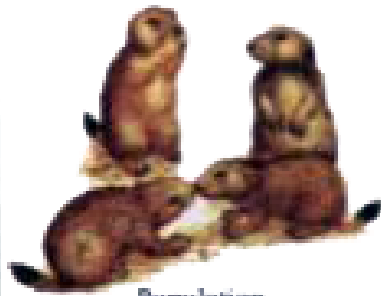
All the ants in an anthill \_\_\_\_\_.



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Organism



Population



Community



Ecosystem

5.

A Ecosystem

B Habitat

C Community

D Population Choose the most appropriate vocabulary term from the list above and answer the following:

All the blackbirds in your neighbourhood\_\_\_\_\_.



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6. Match with one or more than one correct answer:

Column A	Column B
(i) Ecosystem	(p) food chain
(ii) Producers	(q) depend on plant food
(iii) Bacteria	(r) food energy
(iv) Persistent pesticide	(s) abiotic components
(v) Omnivores	(t) depend on animal food
	(u) decomposers
	(v) biomagnifications
	(w) biotic components
	(x) transducer



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7. Frog  $\leftarrow$  grasshopper  $\leftarrow$  grass. Here, frog is.

A. primary producer

B. herbivore



C. carnivoree

D. primary consumer

**Answer: C**



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**8.** Which group of organisms do not make a complete food chain?

A. Grass, lion, rabbit, wolf

B. Plankton, human, fish, grasshopper

C. Wolf, grass, snake, tiger

D. Frog, snake, eagle, grass, grasshopper

**Answer: B**



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**9. Biosphere is made of .**

A. living beings and their remains

B. living beings + lithosphere +

hydrosphere + atmosphere

C. living beings + lithosphere

D. living organisms + lithosphere +  
hydrosphere

**Answer: B**



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

A. respired and becomes heat

B. passed on as faeces or urine

C. stored as body tissue

D. recycled to autotrophs

**Answer: B**



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**11.** Consider the correct statements concerning food chains from the following statements:

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 chain is generally limited to three to four trophic levels due to energy loss.

D. The length of food chains may vary from two to eight trophic levels.

**Answer: C**



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**12.** Which of the following statements are true?

A. Energy flows through populations except for the amount that becomes

urine and faeces.

B. While it might seem otherwise, more energy flows through predator food webs than detrital food webs.

C. Ecological pyramids typically pertain to grazing food webs only.

D. Because of biological magnification, certain pollutants are more concentrated in final consumers.

**Answer: C**



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**13.** In a natural ecosystem, decomposers include

- A. Bacteria and fungi
- B. Parasitic algae
- C. Macroscopic animals
- D. All of the above

**Answer: A**





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14. Pollution is not caused by

- A. Thermal power plants
- B. Automobiles
- C. Radioactive
- D. Hydroelectric power plants

**Answer: D**



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15. Air is a/an

- A. Exhaustible resource
- B. Inexhaustible resource
- C. Perishable resource
- D. Both B and C

**Answer: D**



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16. Day time temperature of moon is

A.  $60^{\circ} C$

B.  $70^{\circ} C$

C.  $90^{\circ} C$

D.  $110^{\circ} C$

**Answer: D**



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17. Percentage of total water found as fresh water is

A. 0.46

B. 0.32

C. 0.16

D. 2.5 %

**Answer: D**



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**18.** Fertilizers cause

- A. Eutrophication of water bodies
- B. Killing of most microorganisms
- C. Destruction of crumb structure of soil
- D. All of the above

**Answer: D**



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**19.** Wind causes weathering of rocks through

A. Chemical change

B. Abrasion

C. Mechanical force

D. Frost action

**Answer: C**



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**20. Forest destruction results in**

A. Loss of wild life

B. Floods and drought

C. Soil erosion

D. All of these

**Answer: D**



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21. The ultimate source of energy in an ecosystem is

A. Sunlight

B. Glucose

C. Protein

D. Green plants

**Answer: A**



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**22. Which are sensitive to  $SO_2$  pollution?**

A. Mosses

B. Lichens



C. Algae

D. ferns

**Answer: B**



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**23.** Pollution of water is caused by

A. Industrial effluents

B. Sewage

C. Farm runoff

D. All of these

**Answer: D**



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**24.** Greenhouse effect is caused by

A. Green plants

B. Infrared rays

C. UV-rays

D. X-rays

**Answer: C**



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**25.** Air is a

A. good conductor of heat

B. bad conductor of heat

C. neither good or bad conductor of heat

D. sometimes good and sometime bad

conductor of heat

**Answer: B**



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**26.** Greenhouse is related to

- A. Global warming
- B. Terrace gardening
- C. Kitchen garden
- D. Increase growth of algae

**Answer: A**



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27. Major source of formation of soil is

A. Rocks

B. Snow covered mountains

C. River beds

D. Volcanoes

**Answer: A**



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**28.** Solar radiation heats up

- A. Land faster than the water bodies
- B. Land slower than the water bodies
- C. Equally both land and water bodies
- D. Neither land nor water bodies

**Answer: B**



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**29.** Soil erosion is caused due to

A. Strong wind

B. Heavy rains

C. Keeping the fields fallow for a long

D. All of these

**Answer: D**



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30. Name the gas which plays major role in global warming.

A. CO

B. NO

C.  $CO_2$

D.  $SO_2$

**Answer: C**



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31. The conversion of  $NO_3$ , to  $N_2$ , is called

- A. Nitrification
- B. Denitrification
- C. Ammonification
- D. Nitrogen fixation

**Answer: B**



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32. Nitrosomonas bacteria convert

- A. Nitrite to nitrate
- B. Ammonia into nitrate
- C. Ammonia into nitrite
- D. Ammonia into ammonia

**Answer: D**



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**33.** Which of the following contribute to greenhous effects?

A. Methane

B.  $CO_2$

C. CFC

D. All of these

**Answer: D**



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**34. Who is popularly known as water man?**

A. Gajendra Singh

B. Rajendra Singh

C. Louis Pasteur

D. Tansley

**Answer: B**



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**35.** CFCs have been in use for

A. Aerosol propellants

B. Formation of foam

C. Refrigerators

D. All of the above

**Answer: D**



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**36. Ozone hole was discovered in**

A. 1992

B. 1985

C. 1995

D. 1998

**Answer: B**



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**37.** The current  $CO_2$  concentration of atmosphere is.

A. 300 ppm

B. 345 ppm

C. 387 ppm

D. 423 ppm

**Answer: D**



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**38.** The total earth surface covered by water is

.

A. 0.95

B. 0.6

C. 0.85

D. 0.5

**Answer: C**



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**39.** Major source of mineral in soil is the

A. Present rock from which soil is formed

B. Plants

C. Animal

D. Bacteria



**Answer: A**



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**40.** Biotic component of biosphere is not constituted

A. Producer

B. Consumer

C. Decomposer

D. Air

**Answer: D**



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**41.** Cadmium pollution of water produces a human disease.

- A. Plumbasim
- B. Black foot disease
- C. Minamata disease
- D. Itai-Itai

**Answer: D**



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**42.** Percolation tanks and wells are used for

A. Irrigation

B. Harvesting of flood water

C. Supply of drinking water

D. All of the above

**Answer: D**



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**43.** Cause of water pollution are

A. Inorganic

B. Organic

C. Biological

D. All of these

**Answer: D**



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44. Photochemical smog is formed by

A.  $NO_2$

B.  $SO_2$

C.  $CO_2$

D.  $CO_2$

**Answer: A**



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45. Which of the following is a secondary pollutant ?

A. PAN

B. Hydrocarbon

C. CFC

D. Particulate matter

**Answer: A**



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**46.** SPM includes

- A. Fly ash
- B. Dust
- C. Soot and smoke
- D. All of the above

**Answer: D**



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**47.** Soil is the component of

A. Atmosphere

B. Hydrosphere

C. Lithosphere

D. None

**Answer: C**



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**48.** Ozone hole over Antarctica appears during

A. spring



B. summer

C. autumn

D. winter

**Answer: A**



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**49.** Greenhouse effect is caused by

A. green plants

B. infrared rays

C. UV-rays

D. X-rays

**Answer: B**



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**50.** The ecosystem which comprises of both abiotic and biotic components are

A. producer

B. consumer

C. decomposers

D. All of these

**Answer: D**



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51. The gas which do not play a major role in greenhouse effect is

A.  $CO_2$

B. CFC

C.  $CH_4$

D.  $H_2O$

**Answer: D**



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**52.** Thickness of ozone layer is measured by

A. Dobson unit

B. Newton

C. Dyne

D. Pascal

**Answer: A**



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## Olympiad And Ntse Level Exercises

1. Common indicator organism of water pollution is

A. *Eichhornia crassipes*

B. *Escherichia coli*

C. *Entamoeba histolytica*

D. *Lemna paucicostata*

**Answer: B**



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2. Reasons that the population size of an exotic species often grows rapidly when the species is introduced in a new environment include which of the following:

(i) The exotic species is resistant to pesticides.

(ii) There is a large, underutilised food source in the new environment.

(iii) The exotic species has few natural predators in the new environment.

A. (i) only

B. (ii) only

C. (i) and (iii) only

D. (ii) and (iii) only

**Answer: D**



3. Tree → Caterpillar → Robin Cat represents a food chain. In this food chain, if the tree can provide 100000 calories of energy, how much calories of energy will be available to the robin and the cat?

- A. 10000 and 1000 calories, respectively
- B. 1000 and 100 calories, respectively
- C. 1000 and 10000 calories, respectively
- D. 100 and 1000 calories, respectively



**Answer: A**



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**4.** Read the assertion and reason carefully to mark the correct option in question.

Assertion: 99 per cent animals and nearly all plants are conformers.

Reason: During the course of evolution, the costs and benefits of maintaining a constant internal environment are taken into consideration.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: A**



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5. Identify the incorrect statement from the following.

A. Stenothermal live within both narrow and wide range of temperature.

B. Next to temperature water is the most important factor

C. Regulators cannot maintain homeostasis

D. Hibernation is the winter sleep

**Answer: B**



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**6.** Which one shows the adaptations of xerophytes correctly?

A. Roots grow very deeply to explore any possibility of available underground water.

B. Leaves are highly reduced (spines) to minimise the transpiration.

C. In some plants leaves become leathery and get coated with waxy covering to reduce transpiration.

D. All of the above

**Answer: D**



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7. The adaptation of some animals and plants are given below. Identify the incorrect one.

A. Nerium -Sunken stomata (xerophytic)

B. Nymphaea - Poorly developed roots  
(hydrophytic)

C. Horseshoe bat – Excrete solid urine

D. Locusts - Periodic migration

**Answer: C**



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## Challenging Exercise

1. Why is the transfer of energy in an ecosystem known as energy flow, not energy cycling?



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2. How are detritivores or decomposers essential for sustaining ecosystems?



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3. Why does the pyramid of energy have the same general shape as the biomass pyramid in most ecosystems? Under what circumstances might the shapes of the two pyramids differ?



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4. In the context of biological magnification of toxins, is it healthier to feed at a lower or higher trophic level? Explain.





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