BIOLOGY

BOOKS - CENGAGE BIOLOGY

BIOGEOCHEMICAL CYCLES

Mandatory Exercise

1. What are three large reservoirs where carbon is found in the biosphere?

(a) As carbon dioxide gas in the_____.

(b) As dissolved CO_2 in the._____.

(c) As coal, petroleum, and calcium carbonate rock found in._____.

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2. Why is carbon especially important to living systems?

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3. Match the following terms with their definitions:

Column A	Column B
(i) Ammonification	(p) Conversion of atmospheric nitrogen (N_2) into ammonia (NH_3)
(ii) Denitrification	(q) Conversion of organic nitrogen (e.g., in amino acids) into ammonia
(iii) Nitrification	(r) Conversion of nitrite (NO_2^-) or nitrate (NO_3^-) into atmospheric nitrogen
(iv) Nitrogen fixation	(s) Conversion of ammonium (NH_4^+) into nitrite and nitrate

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4. What are the three biogeochemical cycles that play prominent roles in the biosphere?

(a)_____.

(b)_____.

(c) _____.

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5. How is CO_2 concentration of atmosphere rising?

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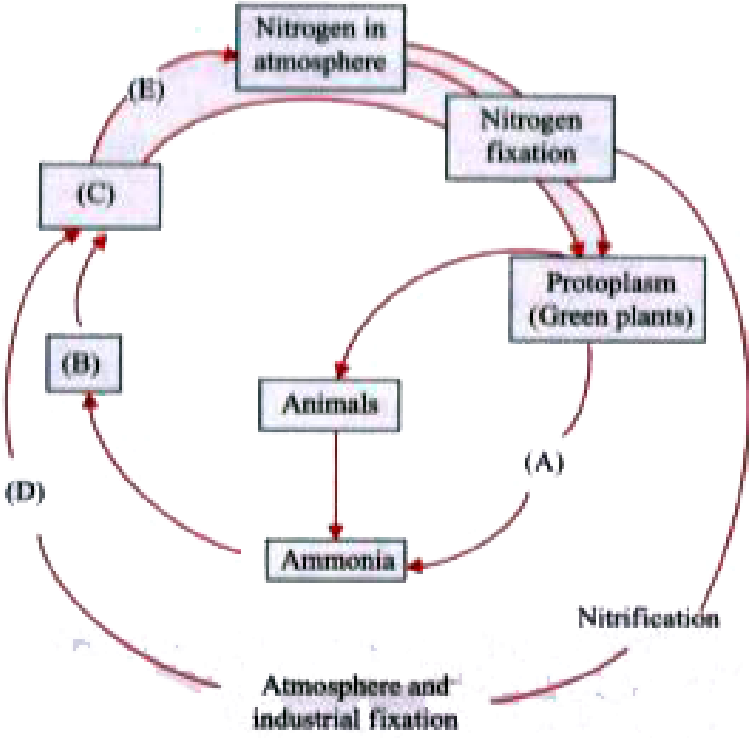
Consolidated Exercise

1. Observe the diagram of the nitrogen cycle and answer the questions given below:



(a) Fill in the blanks A to E.

(b) What will happen if the step A does not take place?

(c) What will happen if the step E does not take place?

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2. A farmer wonders whether or not he should add a nitrification inhibitor, which would reduce the amount of nitrification occurring in his fields. If he adds the inhibitor, there are

several possible effects it might have on the N, cycle. Indicate with a check mark whether by adding the inhibitor to his fields he will most likely increase, decrease, or not affect the following nitrogen cycling processes?

Gaseous	Increase	Decrease	No effects
NH_4^+ available to his crops			
Leaching loss of NO_3^-			
N_2 fixation			
Ammonification			

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3. Match the following with one or more than one correct answer:

Column A	Column B
(i) Phosphorus cycle	(p) *Pseudomonas*
(ii) Nitrification	(q) Burning of fossil fuels
(iii) Denitrification	(r) Gaseous cycle
(iv) Carbon cycle	(s) *Nitrosomonas*
	(t) Sedimentary cycle
	(u) Element enters the biotic reservoir through photosynthesis
	(v) *Nitrobacter*
	(w) Erosion of land

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4. Which of the following is/are gaseous cycle?

A. Oxygen cycle

B. Nitrogen cycle

C. Hydrogen cycle

D. Phosphorus cycle

Answer: A

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5. Role of bacteria in carbon cycle is

A. photosynthesis

B. chemosynthesis

C. breakdown of organic compounds

D. assimilation of nitrogen compounds

Answer: C

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6. How do nitrogen-fixing bacteria contribute to the nitrogen cycle?

A. They return nitrogen (N_2) to the atmosphere.

B. They change ammonium to nitrate.

C. They change N_2 to ammonium.

D. They decompose and return nitrogen to autotrophs.

Answer: C

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7. Nitrates are transformed into nitrogen by

A. ammonifying bacteria

B. nitrifying bacteria

C. denitrifying bacteria

D. nitrogen-fixing bacteria

Answer: C

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8. In the phosphorus cycle, phosphate becomes available by weathering of rock first to.

A. consumers

B. producers

C. decomposers

D. atmosphere

Answer: B

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9. Which of the following accurately represent/s a carbon source and the process, which releases carbon from that source?

A. Fossil fuels, combustion

B. Animals, photosynthesis

C. Plants, photosynthesis

D. Limestone, cellular respiration

Answer: A

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10. Which of the following is true and that differs from the carbon cycle?

A. There is little or no human impact on the phosphorus cycle.

B. Phosphorus is not a critical component of living organisms.

C. The hydrosphere contributes to part of the phosphorus cycle.

D. The atmosphere does not contribute to part of the phosphorus cycle.

Answer: D

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11. Nif genes occur in .

A. Rhizobium

B. Streptococcus

C. Penicillium

D. Aspergillus

Answer: A

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12. The conversion of NO_2 and N_2 is called.

A. Nitrification

B. Denitrification

C. Ammonification

D. Nitrogen fixation

Answer: B

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13. Oxygen is returned to the atmosphere mainly by

A. Burning of fossil fuel

B. Respiration

C. Photosynthesis

D. Fungi

Answer: C

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14. The step not involved in the carbon cycle is

A. Photosynthesis

B. Transpiration

C. Respiration

D. Burning of fossil fuel

Answer: B

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15. Oxygen is poisonous for which living being.

A. All bacteria

B. Aerobic bacteria

C. Anaerobic bacteria

D. None of the above

Answer: C

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16. Which among the following has a sedimentary cycle?

A. Nitrogen

B. Carbon

C. Water

D. Sulphur

Answer: D

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17. Carbon is found in lithosphere as

A. Carbohydrate

B. Carbonic acid

C. Carbon

D. Carbonate

Answer: D

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18. Water cycle is made up of two overlapping cycles

A. Ground water and atmospheric cycles

B. Surface water and atmospheric cycles

C. Global and local cycles

D. Oceanic and fresh water cycles

Answer: C

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19. CO_2 content of atmosphere is about

A. $6.5\ \%$

B. $3.334\ \%$

C. $0.34\ \%$

D. $0.034\ \%$

Answer: D

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20. Natural source of phosphorus is .

A. Rock

B. Water

C. Atmosphere

D. None

Answer: A

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21. The limiting factor of soil nitrification is

A. Soil pH

B. Light

C. Temperature

D. Air

Answer: A

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22. Nitrogen present in atmosphere is

A. $78\ \%$

B. $10\ \%$

C. 3%

D. 0%

Answer: A

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23. Phosphorus is present in

A. Nucleic acid

B. NAD

C. FAD

D. All of the above

Answer: D

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Olympiad And Ntse Level Exercises

1. The natural cycle that circulates elements between the earth and the environment is called

A. biological cycle

B. chemical cycle

C. biogeochemicacl cycle

D. nitrogen cycle

Answer: C

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2. The phosphours cycle differs from those of carbon and nitrogen as well as from those of sulphur , oxygen and hydrogen in that it lacks .

A. water

B. dust particle

C. gaseous phase

D. All of the above

Answer: C

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3. Deforestion cause

A. decline in percenatage of oxygen in air

B. increase in precentage of carbon dioxide in air

C. both decline and increase in percenatage of oxygen and carbon dioxide, respectively

D. none of these

Answer: C

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4. Which of the following contribute to the carbon cycle ?

A. photosynthesis

B. Respiration

C. Fossil fuel combustion

D. All of the above

Answer: D

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5. Which one of the following is an inexhaustile source of energy and also does not cause pollution ?

A. Solar energy

B. nuclear energy

C. fuel wood

D. coal

Answer: A

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6. Ecosystem obtain nitrogen from outside through the process of

A. electronchemical fixation

B. industrail fixaiton

C. biological fixation

D. All of the above

Answer: A

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7. A molecule of nitrogen which you have just breathed in may have been part of a plant that lived thousands of years ago, a part of a dinosaur that lived millions of years ago . This illustrates the principle that .

A. dead organisms may be fossilsed

B. nitrogen does not combine redaily with other elements

C. decay bacteria cycle elements

D. nitrogen froms part of the protein of plants and animals .

Answer: D

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

Assertion : Nutrients cycle means cycling of

glucose or reserved food material within the plant body.

Reason : Transfer of nutrients between living and non - living components is called biogeochemical cycle .

A. If Both A and R are true and R is the correct explanation of A

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

C. If a is true but R is false

D. If A is false but R is true.

Answer: D

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Challenging Exercise

1. Why does deforestiona of a watershed increase the concentration of nitrates in streams draining the watershed ?

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2. The amount of nitrogen fixed by natural and anthropogenic process is approximately equivalent to 90-140 Tg (tetragrams) N_2 fixed year. What are the sources of natural and anthropogenic nitrogen ?

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