



BIOLOGY

BOOKS - CENGAGE BIOLOGY

ENVIRONMENTAL ISSUES

Mandatory Exercise Exercise Set I

1. Define pollution.



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2. Define Pollutant .



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3. Differentiate Point and non-point sources of water pollution.



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4. Differentiate Primary and secondary pollutant.



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5. Differentiate between biodegradable and non-biodegradable pollutants.



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6. Any alteration of Earth's atmosphere by chemical, particulate or biological material is _____



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7. Write any two sources of air pollution



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8. Write any two sources of water pollution



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9. Write any two sources of soil pollution



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10. Write the full form of PAN



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11. Write the full form of BOD



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12. Match the following:



13. If large quantities of domestic sewage are continuously emptied into a small stream, it leads to

A. algal bloom.

B. increase in temperature.

C. eutrophication

D. depletion of O_2 content in stream water.

Answer: A::C::D



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14. Explain the relationship between the following terms: eutrophication, nutrients, algal bloom, biological oxygen demand and dissolved oxygen.



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15. What are the major causes of eutrophication?



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16. Acid rain has been found to be extremely dangerous. Mention any four effects of acid rain.

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17. Define acid rain and trace the steps in its formation.

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18. Give three ingredients for photochemical smog.



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19. What are the effects of CO



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20. What are the effects of SO_2



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21. What are the effects of NO_x



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22. Mention few effects of soil pollution. Also write the control measures.



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23. Suggest suitable mechanism for waste management in fertilizer industries.



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Mandatory Exercise Exercise Set Ii

1. What is the difference between sound and noise?



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2. Mention two measures to reduce noise pollution in your area.



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3. The range of normal human hearing lies between

A. 500 Hz to 10,000 Hz

B. 2000 Hz to 2,00,000 Hz

C. 5000 Hz to 6000 Hz

D. 10 Hz to 15,000 Hz

Answer: B



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4. Gases referred to as greenhouse gases are

A. CO_2 , O_2 , NO_2 , NH_3

B. Chlorofluorocarbon, CO_2 , NH_3 , N_2

C. CH_4 , N_2 , CO_2 , NH_3

D. Chlorofluorocarbon, CO_2 , CH_4 , NO_2

Answer: D



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5. Mention the objectives of water (prevention and control of pollution) Act



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6. Mention the objectives of air (Prevention and control of pollution) Act



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7. The reduction in the stratospheric concentration of ozone molecules is referred to as ozone_____.



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8. What cause ozone depletion? Name two factors.



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9. Name the first international agreement aimed at removing a number of substances that is thought to cause ozone depletion.



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10. Mention two effects of global warming.



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11. Assertion (A): UV radiation causes photodissociation of ozone into O_2 and O, thus causing damage to the stratospheric change.

Reason (R): Ozone hole is resulting in global warming and climate change.

A. if both A and R are true: 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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12. Define Greenhouse effect



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13. Define Ozone hole



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14. Match the following:



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Consolidated Exercise

1. Identify two human actions that contribute to global warming and explain.



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2. Particle pollution (also called particulate matter or PM) is the term for a mixture of solid particles and liquid droplets found in the air. These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some particles, known as primary particles are emitted directly from a source such as construction sites, unpaved roads, fields, smokestacks or fires. Others form in complicated reactions in the atmosphere of

chemicals such as sulphur dioxides and nitrogen oxides that are emitted from power plants, industries and automobiles, these particles are known as secondary particles. Particles such as dust, dirt or smoke are large or dark enough to be seen with the naked eye. Others are so small that they can only be detected using an electron microscope. The size of particles is directly linked to their potential for causing health problems. Small particles less than 10 micrometres ($0.01\mu m$) in diameter pose the greatest problems, because they can get deep into your lungs, and some

may even get into your bloodstream. Exposure to such particles can affect both your lungs and your heart. Small particles of concern include those found near roadways and dusty industries, which are larger than 2.5 micrometres and smaller than 10 micrometres in diameter, and those found in smoke and haze, which are 2.5 micrometres in diameter and smaller.

What are the two main forms of particulate matter found in air?



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3. Particle pollution (also called particulate matter or PM) is the term for a mixture of solid particles and liquid droplets found in the air. These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some particles, known as primary particles are emitted directly from a source such as construction sites, unpaved roads, fields, smokestacks or fires. Others form in complicated reactions in the atmosphere of chemicals such as sulphur dioxides and nitrogen oxides that are emitted from power

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Suggest a reason why small particles are able to not only affect your lungs but also your heart.



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4. Give reasons:

Why does Mathura refinery pose problems to the Taj Mahal?



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5. Carbon dioxide is necessary for plants. Why do we consider it as a pollutant?



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6. Give reasons:

Why is the ozone layer important to our health?



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7. Give reasons:

Why are lichens not common in Bangalore whereas they commonly grow in Ooty or Bandipur?



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8. Match with one or more than one correct answer.



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Consolidated Exercise Multiple Choice Questions With One Or More Than One Correct Answer

1. Contamination of radioactive materials are dangerous because it causes

A. biological magnification

B. gene mutation

C. photochemical smog

D. ozone destruction

Answer: A::B



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2. Kyoto conference is connected with

A. limiting production of CO_2

B. developing alternatives to ozone
depleting substance

C. reduction in use of energy

D. climatic change

Answer: A



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3. Acid rain is secondary effect of

A. sound pollution

B. soil pollution

C. air pollution

D. water pollution

Answer: C



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4. Exposure to noise pollution causes

A. increased heart beat

B. constriction of blood vessels

C. dilation of pupil

D. minimata disease

Answer: A::B



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5. Non-biodegradable pollutants are

A. market garbage

B. polythene bags

C. animal wastes

D. soft drink cans

Answer: B



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6. Greenhouse gases are

A. CO_2

B. CH_4

C. SO_2

D. CFC

Answer: A::B::D



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7. Which one of the following is not pollutants.

A. CO_2

B. CO

C. SO_2

D. NO_2

Answer: A



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8. Green muffler is related to pollution of

A. Air

B. Soil

C. Noise

D. Water

Answer: C



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9. Peeling of ozone umbrella is due to

A. CFC

B. PAN

C. CO_2

D. Coal burning

Answer: A



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10. Sewage water is purified by

A. Micro-organisms

B. Light

C. Fishes

D. Aquatic plants

Answer: A



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11. Photochemical smog always contains

A. Ozone

B. Methane

C. CO_2

D. CO

Answer: A



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12. Carbon monoxide kills because it destroys.

A. Haemoglobin

B. Phytochrome

C. Cytochrome

D. Both A and B

Answer: A



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13. Pollution arises due to

A. Rains

B. Research institutes

C. Population explosion

D. Automobiles and industries

Answer: D



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14. One of the indicator of water pollution is

A. E. coli

B. Lichen

C. Plants

D. Animals

Answer: A



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15. The photochemical oxidants in air pollutant include

A. Nitrogen oxide, nitric acid and nitric oxide

B. Oxygen, chlorine and nitric acid

C. Ozone, peroxyacetyl nitrate and aldehydes

D. Carbon monoxide and sulphur dioxide

Answer: C



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16. The organisms which are sensitive to SO_2 pollution is

A. Mosses

B. Lichens

C. Algae

D. Ferns

Answer: B



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17. Eutrophication results in reduction of:

A. Dissolved hydrogen

B. Dissolved oxygen

C. Mineral salts

D. Dissolved nitrate

Answer: B



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18. First atom bomb was exploded on

A. 30 November, 1945

B. 15 August, 1950

C. 10 January, 1946

D. 6 August, 1945

Answer: D



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19. The most polluted air in a metropolitan city of India is

A. Lucknow

B. Mumbai

C. Delhi

D. Hyderabad

Answer: C



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20. Silent killer gas is

A. SO_2

B. CO

C. CO_2

D. Biogas

Answer: B



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21. SO_2 and NO_2 cause pollution by increasing

A. Acidity

B. Alkalinity

C. Buffer action

D. None of these

Answer: A



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22. Solar radiation heat 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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23. Soil erosion is caused due to

A. Strong wind

B. Heavy rains

C. Keeping the field fallowing for a long time

D. All of these

Answer: D



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24. Soil erosion can be prevented by

A. Terrace farming

B. Intensive cropping

C. Deforestation

D. Both A and B

Answer: D



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25. Smoke and Fog combinedly forms

A. Rain

B. Soil

C. Smog

D. Acid rain

Answer: C



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26. Stone leprosy is caused due to

A. Acid rain

B. Ozone depletion

C. Soil erosion

D. None of these

Answer: A



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27. Bhopal gas tragedy was due to the release of

A. Phosgene and methyl isocyanate

B. CO_2

C. NO_2

D. CH_2

Answer: A



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28. National Environmental Engineering Research Institute (NEERI) is located in:

A. Delhi

B. Patna

C. Bhopal

D. Nagpur

Answer: D



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29. El Nino is a

A. Warm ocean

B. Bird

C. River

D. Lake

Answer: A



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30. Oil spills can be treated with bacteria

A. *Pseudomonas putidia*

B. *Bacillus*

C. *Clostridium*

D. All types of bacteria

Answer: A



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31. Ozone day comes on

A. January 30

B. September 16

C. April 21

D. December 25

Answer: B



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32. Air pollution affects:

A. Leaves

B. Roots

C. Stem

D. Flowers

Answer: A



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33. Most harmful type of environmental pollutants are

- A. Human organic wastes
- B. Waste animal feed
- C. Non-biodegradable chemicals
- D. Excess natural nutrients

Answer: C



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34. Which of these is non-biodegradable pollutant?

A. Mud

B. Leaves

C. Plastics

D. Fruits and vegetables

Answer: C



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35. The Taj Mahal is threatened due to the effect of

A. Chlorine

B. SO_2

C. Oxygen

D. Hydrogen

Answer: B



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36. Which part of the living cell is affected by SO_2 ?

- A. Nucleus
- B. Cell membrane
- C. Cell wall
- D. Plasmodesmata

Answer: A



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37. Which air pollutant is not released by motor vehicles?

A. SO_2

B. Fly ash

C. Hydrocarbons

D. CO

Answer: B



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38. "Heat islands" are produced due to:

A. Air pollution

B. Water pollution

C. Land Pollution

D. All of these

Answer: D



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39. One of the most dangerous radioactive pollutant is:

A. Phosphorous-32

B. Strontium-90

C. Calcium-40

D. Polonium-210

Answer: D



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40. Knocking knee disease is caused by

A. Fluorides

B. Arsenic

C. Cadmium

D. Lead

Answer: B



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41. Most sensitive body part for radiation hazard is

A. Brain

B. Gonads

C. Liver

D. Bones

Answer: B



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42. Mental growth of child is affected by

A. Ozone poisoning

B. Lead poisoning

C. Cadmium

D. Arsenic

Answer: D



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43. Cosmic rays comes from

A. Sun

B. Other planets or outer space

C. Stratosphere

D. Both A and B

Answer: D



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Olympiad And Ntse Level Exercises

1. To break tympanum and cause permanent hearing loss, the magnitude of noise pollution required is

A. 100 dB

B. 50 dB

C. 4000-50000 Hz

D. 90 dB

Answer: A



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2. This question consists of two statements:

Assertion and Reason. m

Assertion: The use of UV rays as water purifier is discouraged.

Reason: They do not have residual effect.

A. Assertion is correct and Reason is explanation to Assertion.

B. Assertion is correct and Reason is not an explanation to A.

C. Assertion is true and Reason is wrong.

D. Assertion is wrong and Reason is true.

Answer: A



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3. The ozone layer: Between 15 and 50 km above the earth is a thin layer of gas called 'ozone! It protects the earth from most of the sun's harmful ultraviolet radiation. Too much radiation causes blindness in animals and skin cancer in people. In 1985, scientists discovered

a hole in the ozone layer in the Antarctica. They have recently discovered a smaller hole over the arctic. The ozone layer is also becoming thinner over other locations of the earth too. Scientists believe that over the last 10 years about 30% of the ozone layer has disappeared. This damage is caused by chemicals.

Choose the right statement(s) from the following:

- A. The greenhouse effect would be more efficient and the temperature of earth

would increase.

B. CFCs would result in the depletion of the ozone layer.

C. Infrared radiation from the sun would bombard earth

D. Ultraviolet radiation from the sun cannot enter earth.

Answer: B



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4. Pollutant gases have an adverse effect on the environment and on our health. The amount of these gases has been steadily increasing over the years. The table given below shows the source and the amount of some pollutant gases produced by human activities.



Which one of the following statement(s) is correct?

A. The total sulphur dioxide and nitrogen dioxide produced per year is 145 million tonnes.

B. CO_2 is produced by industries.

C. The combined total pollutant gases produced by NO_2 and hydrocarbons is less than the total pollutant gases produced by SO_2

D. Hydrocarbons are produced by vehicle exhaust gases and industries.

Answer: C



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5. A lake near a village suffered heavy mortality of fishes within a few days. Consider the following reasons for this?

(a) Lots of urea and phosphate fertilizers were used in the crops in the vicinity.

(b) The area was sprayed with DDT by an aircraft.

(c) The lake water turned green and stinky.

(d) Phytoplankton population in the lake declined initially thereby greatly reducing photosynthesis. Which two of the above were the main causes of fish mortality in the lake?

A. (i), (ii)

B. (ii), (iii)

C. (iii), (iv)

D. (i), (iii)

Answer: D



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6. Which one of the following is a heavy metal contaminant that can accumulate in biological organisms with biomagnification effects?

What is the disease caused?

A. aluminium, food poisoning

B. fluorine, fluorosis

C. iron, goitre

D. mercury, Minamata

Answer: D



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7. Exposure of an organism to UV system cause

- A. photodynamic action
- B. formation of thymidine
- C. splitting of H-bonds of DNA
- D. splitting of phosphodiester bonds

Answer: C



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8. Asbestosis increases the risk of developing all of the following except

A. carcinoma of the lungs

B. mesotheliomas

C. bronchiectasis

D. tuberculosis

Answer: D



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9. There are two tanks A and B. Tank A is provided with soil, water and algal culture. Tank B is provided with soil, water, algal culture, phosphates and sulphates. What would be the result of this?

- A. Tank B shows eutrophication and BOD.
- B. Tank A shows eutrophication and BOD.
- C. Neither of the tanks shows growth of algae.
- D. Growth occurs only in tank A.

Answer: A



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Challenging Exercise

1. Analyze the effects of acid rain on soils, water resources, vegetation, animals and humans.



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2. Combustion of fossil fuels is a common denominator for many problems related to atmospheric and water resources. Classify the connections for as many problems as you are able.



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3. What steps can you take to prevent the loss of biodiversity and exploitation of natural resources?



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