## REVIEW CHAPTER 6

**1.** Which of these measures would reduce the quantity of acid rain produced?

I. Removing $SO_2$ from smokestacks
II. Switching to renewable energy
III. Using lime to neutralize acidified lakes
IV. Replacing coal with natural gas as energy source

A. I, II and IV only
B. II and IV only
C. I, II and III only
D. I, III and IV only

**(Total 1 mark)**

**2.** Which is most likely to occur as a result of an **increase** in stratospheric ozone?

A. Increased damage to plant life
B. Reduced concentration of CFCs in the stratosphere
C. Increased formation of photochemical smog
D. Reduction in ultraviolet radiation reaching the Earth's surface

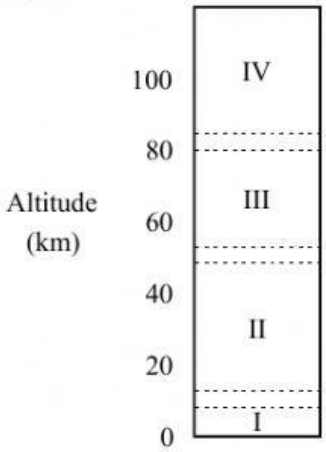
**(Total 1 mark)**

**3.** Photochemical smog is part of a cyclic process which requires ___I___ and produces ___II___.
Select the words that should be inserted from the table below.

| | I | II |
|---|---|---|
| A. | ultraviolet radiation | CFCs |
| B. | sun light and nitrogen oxides | oxygen atoms |
| C. | sun light and water vapour | ultraviolet radiation |
| D. | ultraviolet radiation and carbon dioxide | carbon monoxide |

**(Total 1 mark)**

**4.** This question refers to the graph below.




The troposphere is

A. I.
B. II.
C. III.
D. IV.

**(Total 1 mark)**

**5.** Lime was put into Scandinavian lakes in the 1980s as

A. a response to acid rain from the combustion of fossil fuels in other European countries.
B. an attempt to replace nitrogen lost by excessive harvesting of fish.
C. an attempt to combat eutrophication caused by excessive local use of fertilisers.
D. a waste product from local industrial processes.

**(Total 1 mark)**

**6.** Which row contains correct information on the causes and effects of acid rain?

| | Caused by | Effect |
|---|---|---|
| A. | Halogenated gases and nitric acid | Decrease in oceanic uptake of $CO_2$ by phytoplankton |
| B. | Sulfuric acid and methane | Erosion of buildings and monuments |
| C. | Carbon dioxide and sulfur dioxide | Leaching of calcium ions from soil |
| D. | Carbon dioxide and nitric acid | Increase in skin cancer |

**(Total 1 mark)**

**7.** The ozone layer can be considered as natural capital which is

A. replenishable and provides an essential service.
B. replenishable and provides valuable goods.
C. renewable and provides an essential service.
D. renewable and provides valuable goods.

**(Total 1 mark)**

**8.** Which is the most likely to occur as a result of a reduction of stratospheric ozone?

A. Decrease in the ultraviolet radiation reaching the Earth's surface
B. Reduction of photochemical smog
C. Reduction in the productivity of phytoplankton
D. Increased leaching of aluminium ions attached to soil minerals

**(Total 1 mark)**

**9.** Problems with replacing CFCs (chlorofluorocarbons) with HFCs (hydrofluorocarbons) are that HFCs

I. are powerful greenhouse gases.
II. remain in the atmosphere much longer than CFCs.
III. are expensive to produce.

A. I and II only
B. II and III only
C. I and III only
D. I, II and III

**(Total 1 mark)**

**10.** Which of these statements about ultra-violet (UV) radiation are true?

I. It is absorbed by most greenhouse gases.
II. It reduces productivity in phytoplankton.
III. It is harmful long-wave radiation coming from the sun.

A. I, II and III
B. I and III only
C. II and III only
D. II only

**(Total 1 mark)**

**11.** Which processes occur in the following regions of the atmosphere?

| | Troposphere | Lower Stratosphere | Upper Stratosphere |
|---|---|---|---|
| A. | Natural formation of ozone | Destruction of ozone through human activity | Formation of ozone through human activity |
| B. | Formation of ozone through human activity | Destruction of ozone through human activity | Natural formation of ozone |
| C. | Destruction of ozone through human activity | Natural formation of ozone | Formation of ozone through human activity |
| D. | Formation of ozone through human activity | Natural formation of ozone | Destruction of ozone through human activity |

**12.** Which impact(s) on ecosystems may be associated with the release of sulfur oxides into the atmosphere?

I. Increased uptake of aluminium ions by living organisms
II. A decrease in certain mineral storages in the soil
III. Reduced leaf surface area in coniferous forests

A. I, II and III
B. I and III only
C. I only
D. III only

**(Total 1 mark)**

**13.** Which column in the table correctly shows the effects of the pollutant gas?

| | A. | B. | C. | D. |
|---|---|---|---|---|
| | **Sulphur dioxide** | **Halogenated gases** | **Methane** | **Carbon dioxide** |
| increases the greenhouse effect | Yes | No | Yes | Yes |
| depletes stratospheric ozone | Yes | Yes | No | Yes |
| increases acidity of rain | Yes | No | No | Yes |

**(Total 1 mark)**

**14.** The ozone layer can be protected by

I. using substitutes for ozone-depleting chemicals.
II. reducing cattle production.
III. recycling old refrigerators.

A. I and II only
B. I and III only
C. II and III only
D. I, II and III

**(Total 1 mark)**

**15.** The Montreal Protocol was an agreement on

A. slowing down world population growth.
B. reducing carbon dioxide emissions.
C. reducing the production of chlorofluorocarbons.
D. reducing the number of coal-fired power stations.

**(Total 1 mark)**

**16.** Which is the correct set of statements?

| | **Troposphere** | **Stratosphere** |
|---|---|---|
| A. | Absorbs large proportions of long-wave radiation from above; temperature increases with altitude | Absorbs large proportions of short-wave radiation from below; temperature decreases with altitude |
| B. | Absorbs large proportions of long-wave radiation from below; temperature decreases with altitude | Absorbs large proportions of short-wave radiation from above; temperature increases with altitude |
| C. | Absorbs large proportions of short-wave radiation from above; temperature increases with altitude | Absorbs large proportions of long-wave radiation from below; temperature decreases with altitude |
| D. | Absorbs large proportions of short-wave radiation from below; temperature decreases with altitude | Absorbs large proportions of long-wave radiation from above; temperature increases with altitude |

**17.** In a country in which most energy is obtained from burning fossil fuels, which of the following will tend to reduce the amount of acid deposition?

A. Switching from conventional to nuclear power stations
B. Reducing tax on fossil fuels
C. Using lead-free petrol (gasoline) in cars
D. Banning the use of substances that harm the ozone layer, such as CFCs

**(Total 1 mark)**

**18.** Which row contains correct statements about ozone depletion and global warming?

| | Ozone depletion is … | Greenhouse effect is … |
|---|---|---|
| A. | a necessary condition for life on Earth. | caused by ultraviolet radiation. |
| B. | caused by ultraviolet radiation. | caused by carbon dioxide, methane and CFCs. |
| C. | a cause of damage to photosynthetic organisms. | a cause of increases in the rate of skin cancer. |
| D. | caused by CFCs. | a necessary condition for life on Earth. |

**(Total 1 mark)**

**19.** Why is lime sometimes added to acid lakes?

A. To lower the pH of the water
B. To raise the pH of the water
C. To kill poisonous fish
D. To prevent eutrophication

**(Total 1 mark)**

**20.** Which statement about the ozone layer is correct?

A. Fluorine released from chlorofluorocarbons combines with carbon dioxide molecules in the upper atmosphere to form ozone.
B. Acid rain is caused by an increase in the amount of ultraviolet radiation that penetrates the ozone layer.
C. The burning of fossil fuels causes the formation of ozone, which gradually diffuses to the stratosphere.
D. Ultraviolet radiation is absorbed during the process of stratospheric ozone formation.

**(Total 1 mark)**

**21.** Which is the most likely to occur as a result of a reduction of stratospheric ozone?

A. Increase in the amount of damage to plant life at the Earth's surface
B. Reduction of photochemical smog
C. Reduction in ultraviolet radiation reaching the Earth's surface
D. Increase in human respiratory problems

**(Total 1 mark)**

**22.** Which of the following is **not** a result of acid deposition from burning of fossil fuels?

A. Leaching of calcium from soils
B. Death of coniferous trees in forests
C. Killing of fish due to high levels of aluminium in lakes
D. Thermal expansion of oceans

**(Total 1 mark)**

**23.** Why is powdered limestone sometimes spread on lakes?

A. To encourage the growth of a sustainable crop of fish
B. To decrease the alkalinity of the water
C. To reduce the acidity caused by air pollution
D. To neutralize the effect of methane escaping from organic matter

**(Total 1 mark)**

**24.** What is a reduction in the amount of ozone in the upper atmosphere most likely to lead to?

A. Damage to plant tissues by ultraviolet radiation
B. Rapid global warming
C. A decrease in rainfall
D. An increase in acid rainfall

**(Total 1 mark)**

**25.** What is the possible result of depletion of stratospheric ozone?

A. Increased acidification of rain
B. Reduced amounts of energy fixed by phytoplankton
C. Increased levels of greenhouse gases
D. Reduced levels of ultraviolet light reaching the Earth's surface

**26.** Which of these human activities both increases global warming and depletes the ozone layer?

A. Emission of carbon dioxide from vehicle exhausts
B. Emission of sulfur dioxide from power stations
C. Leakage of methane from gas pipelines
D. Release of CFCs from old refrigerators

**(Total 1 mark)**

**27.** Which method would be most effective in reducing the acidity of rain downwind of a coal-fired power station?

A. Burning high sulfur coal
B. Increasing the temperature at which fuel is burned
C. Fitting wet scrubbers (filters) to chimneys
D. Converting the power station to burn high sulfur oil

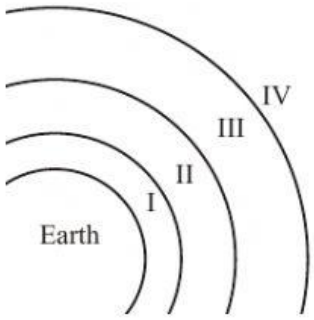
**(Total 1 mark)**

**28.** Which factor greatly increases the likelihood of photochemical smog forming over a city?

A. Low altitude
B. High rainfall
C. High traffic densities
D. Short daylight hours

**(Total 1 mark)**

**29.** The figure below represents the different layers of the atmosphere




Which layers correspond to the troposphere and the stratosphere?

| | Troposphere | Stratosphere |
|---|---|---|
| A. | I | II |
| B. | I | III |
| C. | II | III |
| D. | II | IV |

**(Total 1 mark)**

**30.** Which statement is correct?

A. Ozone is destroyed by carbon dioxide released by burning of fossil fuels.
B. During recent decades the ozone hole over the Antarctic has become larger, producing global warming.
C. Ultraviolet radiation is involved in the production of stratospheric ozone.
D. Ozone is essential for human respiration.

**(Total 1 mark)**

**31.** Which of the following are possible effects of acid deposition?

I. Death of fish due to increasing levels of aluminium in lakes
II. Reduction of forest productivity due to depletion of soil nutrients
III. Death of trees due to decreasing levels of aluminium in soils

A. I and II only
B. II and III only
C. I and III only
D. I, II and III

**(Total 1 mark)**

**32.** Which statement about photochemical smog is correct?

A. Photochemical smog is independent of local topography and climate.
B. Photochemical smog is a mixture of snow and rain formed when the upper air temperature is below freezing.
C. Photochemical smog results from the meeting of two air streams in areas of low pressure.
D. Photochemical smog is a mixture of pollutants formed under the influence of sunlight.

**(Total 1 mark)**

**33.** Which atmospheric gas filters out harmful ultraviolet radiation?

A. Oxygen
B. Ozone
C. Carbon dioxide
D. CFCs

**(Total 1 mark)**

**34.** Which of the following are normally associated with the formation of photochemical smog?

I. Nitrogen oxides
II. Sunlight
III. Volatile organic compounds
IV. Clouds

A. I and III only
B. III and IV only
C. I, II and III only
D. I, II, III and IV

**(Total 1 mark)**

**35.** For which environmental impacts has acid deposition been identified as a significant cause?

I. Leaching of calcium from soil
II. Increasing the rate of respiratory problems in humans
III. Contamination of fish with toxic aluminium
IV. Increasing the productivity of marine phytoplankton

A. I and II only
B. I and IV only
C. I, II and III only
D. I, II, III and IV

**(Total 1 mark)**

**36.** Which of the following is most likely to lead to increased mutation rates in phytoplankton?

A. Increase in stratospheric ozone
B. Decrease in stratospheric ozone
C. Increase in tropospheric ozone
D. Decrease in tropospheric ozone

**(Total 1 mark)**

**37.** Which of the following has been most effective in reducing world emissions of CFCs?

A. Improved technologies in the development of electric cars
B. Aid programmes to developing countries
C. Policies to minimize the combustion of fossil fuels
D. International agreements, including the Montreal Protocol

**38.** What happens when sunlight interacts with pollutants in the lower atmosphere?

A. Destruction of the ozone layer occurs
B. Stratospheric ozone is produced
C. Thermal inversion occurs
D. Photochemical smog is produced

**(Total 1 mark)**

**40.** Which statement about acid rain is correct?

A. Acid rain is a problem of developed countries because it is always deposited onto industrial areas.

B. Rain with pH above 7 is considered to be acid rain.

C. Lime can be used to restore acidified lakes.

D. Corrosion of buildings and rising sea levels are two of the main effects of acid rain.

**(Total 1 mark)**

**41.** Which of the following pairs of statements about ozone is correct?

| | **Tropospheric ozone** | **Stratospheric ozone** |
|---|---|---|
| A. | It is significantly affected by increasing levels of CFCs | It accumulates in high concentration to form the ozone layer |
| B. | It causes health problems in humans and animals | It is significantly affected by increasing levels of CFCs |
| C. | It accumulates in high concentration to form the ozone layer | It damages photosynthetic organisms |
| D. | It damages photosynthetic organisms | It causes health problems in humans and animals |

**(Total 1 mark)**