

Student: _____

1. The most abundant element in the atmosphere is
 - A. Nitrogen.
 - B. Oxygen.
 - C. Argon.
 - D. Carbon dioxide.
2. Water vapor can be the _____ most abundant gas component of the Earth's atmosphere, with concentrations of up to _____.
 - A. Third; 3 percent
 - B. Second; 70 percent
 - C. Fifth; 1 percent
 - D. Tenth; 2 percent
3. Carbon dioxide is added to the atmosphere as a result of
 - A. Combustion.
 - B. The product of respiration.
 - C. Volcanic eruptions.
 - D. All of the choices are correct.
4. The atmospheric residence times of inert gases, such as helium and argon,
 - A. Are quite short, as these gases are removed by precipitation.
 - B. Are strongly controlled by human activities.
 - C. Have virtually infinite residence times.
 - D. Cannot be estimated because their natural cycles are complex.
5. The single largest source of atmospheric pollutants is
 - A. Industrial and manufacturing activities.
 - B. Electricity-generating plants.
 - C. Transportation.
 - D. Waste disposal by incineration.
6. Significant sources for dust and other particulates in the atmosphere include all of the following except
 - A. Combustion products of fuel, including soot, smoke and ash as well as vegetation burning, planned fires or wildfires.
 - B. Dust devils.
 - C. Glacial melt.
 - D. Building demolition.
7. Particulate air pollutants
 - A. Are chiefly produced by human activities, not natural processes.
 - B. Typically have short residence times in the atmosphere.
 - C. Are unsightly but not unhealthy.
 - D. All of the choices are correct.
8. The automobile is the primary source of this pollutant.
 - A. Carbon monoxide
 - B. Sulfur dioxides
 - C. Particulate
 - D. All of the choices are correct.

9. The gas that is produced when oxygen is less and as a result of the incomplete combustions materials bearing carbon is
 - A. Water vapor.
 - B. Carbon dioxide.
 - C. Carbon monoxide.
 - D. All the choices are correct.
10. The most important function of the ozone layer in the stratosphere is
 - A. Conversion of oxygen to O₃.
 - B. Destruction of CFCs, that otherwise would accumulate in the atmosphere and cause increased incidence of lung cancer.
 - C. Absorption of incoming UV radiation from the sun, that otherwise would increase the risk of skin cancer.
 - D. Maintenance of the Earth's magnetic field.
11. Ozone is created in the upper atmosphere when UV is absorbed by this
 - A. Nitrogen.
 - B. Oxygen (O₂).
 - C. CFCs.
 - D. Carbon dioxide.
12. The ozone layer is found in the
 - A. Thermosphere.
 - B. Mesosphere.
 - C. Stratosphere.
 - D. Troposphere.
13. Which of the following types of solar radiation is most penetrating into skin or leaves and thus potentially the most hazardous to health?
 - A. Visible light
 - B. UVA (longest-wavelength UV)
 - C. UVB (intermediate-wavelength UV)
 - D. UVC (shortest-wavelength UV)
14. The catalytic converter, a required component for automobile exhaust emission control systems, converts carbon monoxide into
 - A. Pure carbon and oxygen.
 - B. Carbon dioxide.
 - C. Carbonic acid.
 - D. Carbon monoxide (the catalytic converter is designed to remove gases other than carbon monoxide).
15. The thinning of the ozone layer over the Antarctic always occurs at the end of the Antarctic winter because
 - A. UV from the sun is necessary to the creation of ozone from oxygen and the Antarctic receives no UV from the sun during its winter.
 - B. During their winter, residents of the southern hemisphere use more CFCs.
 - C. Ozone is consumed by melting ice as winter transitions to summer.
 - D. The Antarctic experiences its highest level of radiation during its winter.
16. The thinning of the ozone layer over the Arctic at the end of its winter is lesser than what occurs at the end of the Antarctic winter and this difference is possibly due to the following
 - A. Nations of the northern hemisphere are more restrictive on the use of CFCs than are nations of the southern hemisphere.
 - B. The Arctic winter is shorter than the Antarctic winter.
 - C. The Arctic winter is longer than the Antarctic winter.
 - D. The Arctic is a region of ice covering seawater, whereas the Antarctic is a region of ice covering land.

17. The radioactive gas that poses an indoor air-pollution problem is
- Organic.
 - Ozone.
 - Argon.
 - Radon.
18. Radon in homes comes, in part, from
- Fumes given off by insulation materials.
 - Natural rocks and soils and buildings made from these materials.
 - Leakage of exhaust gases from furnaces.
 - All of the choices are correct.
19. Significant components of indoor air pollution include all of the following except
- Radon.
 - Volatile organic compounds.
 - Carbon monoxide.
 - Carbon dioxide.
20. All of the following cause rainwater to be acidic except
- Sulfur dioxide.
 - Nitrogen oxide.
 - Carbon dioxide.
 - Carbon monoxide.
21. Acid rain effects include all of the following except
- Corrosion of building stone and marble statues and headstones.
 - A reduction in the rate of chemical weathering observed in igneous rocks.
 - Defoliation of plants or reduction in viability of plants because of their lowered ability to extract necessary nutrients from soils.
 - Fish kills or decimation of any aquatic organism's population because of inhibition of egg hatching in acidic waters.
22. In urban areas, this gas from internal-combustion engines may contribute to rainfall acidity.
- Sulfur gases
 - Nitrogen oxides
 - Radon
 - Ozone
23. Any rainwater that has a pH less than this is contaminated.
- 7 (neutral)
 - 6
 - 5.6
 - 5
24. Which of the following statements is not true?
- By the time studies of rain acidity were begun, all air was polluted to some extent.
 - Rainfall would not be acidic if burning of sulfur-rich coal were stopped.
 - Rainfall is often more acidic downwind of coal-fired power plants.
 - The problems caused by acid rain vary in severity with local soil and bedrock geology.
25. Thermal inversions
- Occur only in coastal areas because of temperature differences over land and water.
 - Cause more intense precipitation than normal.
 - Have been responsible for all the major and several minor acute air-pollution episodes of the twentieth century.
 - All of the choices are correct.

26. The amount of precipitation can be markedly increased by
- Ozone.
 - Particulate air pollutants.
 - Lead pollution.
 - Sulfur oxides.
27. The method removing carbon from atmospheric circulation and storing it or using it for biological and physical activities is called
- Carbon emission.
 - Carbon absorption.
 - Carbon dissipation.
 - Carbon sequestration.
28. Lowering combustion temperatures in furnaces
- Has no effect on air-pollution emissions.
 - Reduces production of nitrogen oxides.
 - Increases emission of lead and sulfur.
 - Reduces particulate pollution.
29. Carbon dioxide in the atmosphere is chiefly removed by solution into the oceans, from which it is precipitated in carbonate sediments.
True False
30. Carbon monoxide concentrations in the upper atmosphere have been climbing for over a century due to increasing industrialization.
True False
31. Worldwide, there seems to be a negative correlation between cost of gasoline and fuel consumption.
True False
32. Carbon monoxide is principally a local air-pollution problem of areas with heavy traffic, not a global air-pollution problem.
True False
33. The short-wavelength UVC is the most hazardous UV, but is largely absorbed by atmospheric oxygen before it reaches earth's surface.
True False
34. Photochemical smog consists principally of ozone.
True False
35. Lead, which occurs naturally in petroleum, can be removed from gasoline, but it is expensive to do this.
True False
36. All rain is naturally somewhat acidic; "acid rain" is simply more strongly acidic.
True False
37. Both acidity and sulfate concentration in rain have been reduced downwind of Phase I targets of the U.S. Clean Air Act reauthorization of 1990.
True False
38. A thermal inversion exists when a stable warm-air layer becomes established over a colder layer below.
True False
39. Thermal inversion is independent of topographic or geographic locations.
True False

40. Increases in ozone in the upper atmosphere may lead to increased occurrence of skin cancer.
True False
41. The agreement known as the Montreal Protocol is intended to force countries that still put lead in gasoline to stop doing so by the year 2010.
True False
42. A negative correlation between ClO and ozone concentrations in the stratosphere supports the idea that chlorofluorocarbons play a role in ozone destruction.
True False
43. When a chlorine atom destroys an ozone molecule, that chlorine atom is taken "out of circulation" and locked in the product molecule so that it can do no more harm.
True False
44. Electrostatic scrubbers are very efficient at removing particulate pollutants and also operate quite cheaply, so they are now installed on all equipment that generates particulates.
True False
45. One of the controls of air pollution involve conversion of dangerous compounds prior to effluent release to less harmful ones or by pollutants being entrapped at the source.
True False
46. The Pollutant Standards Index is designed to provide a measure of air quality that is directly related to human health effects.
True False
47. The move to smaller, more fuel-efficient cars, begun in response to fuel shortages is continuing unabated and as a result, the concentrations of all atmospheric pollutants are declining.
True False
48. Because of concerns about destruction of the ozone layer, all nations have recently agreed to stop producing chlorofluorocarbon compounds.
True False
49. As long as there is oxygen (O₂) in earth's atmosphere, there will always be ozone in the upper atmosphere.
True False

18 Key

1. The most abundant element in the atmosphere is
A. Nitrogen.
B. Oxygen.
C. Argon.
D. Carbon dioxide.

Montgomery - Chapter 18 #1

2. Water vapor can be the _____ most abundant gas component of the Earth's atmosphere, with concentrations of up to _____.
A. Third; 3 percent
B. Second; 70 percent
C. Fifth; 1 percent
D. Tenth; 2 percent

Montgomery - Chapter 18 #2

3. Carbon dioxide is added to the atmosphere as a result of
A. Combustion.
B. The product of respiration.
C. Volcanic eruptions.
D. All of the choices are correct.

Montgomery - Chapter 18 #3

4. The atmospheric residence times of inert gases, such as helium and argon,
A. Are quite short, as these gases are removed by precipitation.
B. Are strongly controlled by human activities.
C. Have virtually infinite residence times.
D. Cannot be estimated because their natural cycles are complex.

Montgomery - Chapter 18 #4

5. The single largest source of atmospheric pollutants is
A. Industrial and manufacturing activities.
B. Electricity-generating plants.
C. Transportation.
D. Waste disposal by incineration.

Montgomery - Chapter 18 #5

6. Significant sources for dust and other particulates in the atmosphere include all of the following except
A. Combustion products of fuel, including soot, smoke and ash as well as vegetation burning, planned fires or wildfires.
B. Dust devils.
C. Glacial melt.
D. Building demolition.

Montgomery - Chapter 18 #6

7. Particulate air pollutants
A. Are chiefly produced by human activities, not natural processes.
B. Typically have short residence times in the atmosphere.
C. Are unsightly but not unhealthy.
D. All of the choices are correct.

Montgomery - Chapter 18 #7

8. The automobile is the primary source of this pollutant.

- A.** Carbon monoxide
- B. Sulfur dioxides
- C. Particulate
- D. All of the choices are correct.

Montgomery - Chapter 18 #8

9. The gas that is produced when oxygen is less and as a result of the incomplete combustions materials bearing carbon is

- A. Water vapor.
- B. Carbon dioxide.
- C.** Carbon monoxide.
- D. All the choices are correct.

Montgomery - Chapter 18 #9

10. The most important function of the ozone layer in the stratosphere is

- A. Conversion of oxygen to O₃.
- B. Destruction of CFCs, that otherwise would accumulate in the atmosphere and cause increased incidence of lung cancer.
- C.** Absorption of incoming UV radiation from the sun, that otherwise would increase the risk of skin cancer.
- D. Maintenance of the Earth's magnetic field.

Montgomery - Chapter 18 #10

11. Ozone is created in the upper atmosphere when UV is absorbed by this

- A. Nitrogen.
- B.** Oxygen (O₂).
- C. CFCs.
- D. Carbon dioxide.

Montgomery - Chapter 18 #11

12. The ozone layer is found in the

- A. Thermosphere.
- B. Mesosphere.
- C.** Stratosphere.
- D. Troposphere.

Montgomery - Chapter 18 #12

13. Which of the following types of solar radiation is most penetrating into skin or leaves and thus potentially the most hazardous to health?

- A. Visible light
- B. UVA (longest-wavelength UV)
- C. UVB (intermediate-wavelength UV)
- D.** UVC (shortest-wavelength UV)

Montgomery - Chapter 18 #13

14. The catalytic converter, a required component for automobile exhaust emission control systems, converts carbon monoxide into

- A. Pure carbon and oxygen.
- B.** Carbon dioxide.
- C. Carbonic acid.
- D. Carbon monoxide (the catalytic converter is designed to remove gases other than carbon monoxide).

Montgomery - Chapter 18 #14

15. The thinning of the ozone layer over the Antarctic always occurs at the end of the Antarctic winter because
A. UV from the sun is necessary to the creation of ozone from oxygen and the Antarctic receives no UV from the sun during its winter.
B. During their winter, residents of the southern hemisphere use more CFCs.
C. Ozone is consumed by melting ice as winter transitions to summer.
D. The Antarctic experiences its highest level of radiation during its winter.
- Montgomery - Chapter 18 #15*
16. The thinning of the ozone layer over the Arctic at the end of its winter is lesser than what occurs at the end of the Antarctic winter and this difference is possibly due to the following
A. Nations of the northern hemisphere are more restrictive on the use of CFCs than are nations of the southern hemisphere.
B. The Arctic winter is shorter than the Antarctic winter.
C. The Arctic winter is longer than the Antarctic winter.
D. The Arctic is a region of ice covering seawater, whereas the Antarctic is a region of ice covering land.
- Montgomery - Chapter 18 #16*
17. The radioactive gas that poses an indoor air-pollution problem is
A. Organic.
B. Ozone.
C. Argon.
D. Radon.
- Montgomery - Chapter 18 #17*
18. Radon in homes comes, in part, from
A. Fumes given off by insulation materials.
B. Natural rocks and soils and buildings made from these materials.
C. Leakage of exhaust gases from furnaces.
D. All of the choices are correct.
- Montgomery - Chapter 18 #18*
19. Significant components of indoor air pollution include all of the following except
A. Radon.
B. Volatile organic compounds.
C. Carbon monoxide.
D. Carbon dioxide.
- Montgomery - Chapter 18 #19*
20. All of the following cause rainwater to be acidic except
A. Sulfur dioxide.
B. Nitrogen oxide.
C. Carbon dioxide.
D. Carbon monoxide.
- Montgomery - Chapter 18 #20*
21. Acid rain effects include all of the following except
A. Corrosion of building stone and marble statues and headstones.
B. A reduction in the rate of chemical weathering observed in igneous rocks.
C. Defoliation of plants or reduction in viability of plants because of their lowered ability to extract necessary nutrients from soils.
D. Fish kills or decimation of any aquatic organism's population because of inhibition of egg hatching in acidic waters.

22. In urban areas, this gas from internal-combustion engines may contribute to rainfall acidity.
- A. Sulfur gases
 - B. Nitrogen oxides**
 - C. Radon
 - D. Ozone

Montgomery - Chapter 18 #22

23. Any rainwater that has a pH less than this is contaminated.
- A. 7 (neutral)
 - B. 6
 - C. 5.6**
 - D. 5

Montgomery - Chapter 18 #23

24. Which of the following statements is not true?
- A. By the time studies of rain acidity were begun, all air was polluted to some extent.
 - B. Rainfall would not be acidic if burning of sulfur-rich coal were stopped.**
 - C. Rainfall is often more acidic downwind of coal-fired power plants.
 - D. The problems caused by acid rain vary in severity with local soil and bedrock geology.

Montgomery - Chapter 18 #24

25. Thermal inversions
- A. Occur only in coastal areas because of temperature differences over land and water.
 - B. Cause more intense precipitation than normal.
 - C. Have been responsible for all the major and several minor acute air-pollution episodes of the twentieth century.**
 - D. All of the choices are correct.

Montgomery - Chapter 18 #25

26. The amount of precipitation can be markedly increased by
- A. Ozone.
 - B. Particulate air pollutants.**
 - C. Lead pollution.
 - D. Sulfur oxides.

Montgomery - Chapter 18 #26

27. The method removing carbon from atmospheric circulation and storing it or using it for biological and physical activities is called
- A. Carbon emission.
 - B. Carbon absorption.
 - C. Carbon dissipation.
 - D. Carbon sequestration.**

Montgomery - Chapter 18 #27

28. Lowering combustion temperatures in furnaces
- A. Has no effect on air-pollution emissions.
 - B. Reduces production of nitrogen oxides.**
 - C. Increases emission of lead and sulfur.
 - D. Reduces particulate pollution.

Montgomery - Chapter 18 #28

29. Carbon dioxide in the atmosphere is chiefly removed by solution into the oceans, from which it is precipitated in carbonate sediments.
- FALSE**

Montgomery - Chapter 18 #29

30. Carbon monoxide concentrations in the upper atmosphere have been climbing for over a century due to increasing industrialization.
- FALSE**

Montgomery - Chapter 18 #30

31. Worldwide, there seems to be a negative correlation between cost of gasoline and fuel consumption.
FALSE
32. Carbon monoxide is principally a local air-pollution problem of areas with heavy traffic, not a global air-pollution problem.
FALSE
Montgomery - Chapter 18 #31
33. The short-wavelength UVC is the most hazardous UV, but is largely absorbed by atmospheric oxygen before it reaches earth's surface.
FALSE
Montgomery - Chapter 18 #32
34. Photochemical smog consists principally of ozone.
FALSE
Montgomery - Chapter 18 #33
35. Lead, which occurs naturally in petroleum, can be removed from gasoline, but it is expensive to do this.
FALSE
Montgomery - Chapter 18 #34
36. All rain is naturally somewhat acidic; "acid rain" is simply more strongly acidic.
FALSE
Montgomery - Chapter 18 #35
37. Both acidity and sulfate concentration in rain have been reduced downwind of Phase I targets of the U.S. Clean Air Act reauthorization of 1990.
FALSE
Montgomery - Chapter 18 #36
38. A thermal inversion exists when a stable warm-air layer becomes established over a colder layer below.
FALSE
Montgomery - Chapter 18 #37
39. Thermal inversion is independent of topographic or geographic locations.
FALSE
Montgomery - Chapter 18 #38
40. Increases in ozone in the upper atmosphere may lead to increased occurrence of skin cancer.
FALSE
Montgomery - Chapter 18 #39
41. The agreement known as the Montreal Protocol is intended to force countries that still put lead in gasoline to stop doing so by the year 2010.
FALSE
Montgomery - Chapter 18 #40
42. A negative correlation between ClO and ozone concentrations in the stratosphere supports the idea that chlorofluorocarbons play a role in ozone destruction.
FALSE
Montgomery - Chapter 18 #41
43. When a chlorine atom destroys an ozone molecule, that chlorine atom is taken "out of circulation" and locked in the product molecule so that it can do no more harm.
FALSE
Montgomery - Chapter 18 #42

44. Electrostatic scrubbers are very efficient at removing particulate pollutants and also operate quite cheaply, so they are now installed on all equipment that generates particulates.

FALSE

Montgomery - Chapter 18 #44

45. One of the controls of air pollution involve conversion of dangerous compounds prior to effluent release to less harmful ones or by pollutants being entrapped at the source.

FALSE

Montgomery - Chapter 18 #45

46. The Pollutant Standards Index is designed to provide a measure of air quality that is directly related to human health effects.

FALSE

Montgomery - Chapter 18 #46

47. The move to smaller, more fuel-efficient cars, begun in response to fuel shortages is continuing unabated and as a result, the concentrations of all atmospheric pollutants are declining.

FALSE

Montgomery - Chapter 18 #47

48. Because of concerns about destruction of the ozone layer, all nations have recently agreed to stop producing chlorofluorocarbon compounds.

FALSE

Montgomery - Chapter 18 #48

49. As long as there is oxygen (O₂) in earth's atmosphere, there will always be ozone in the upper atmosphere.

FALSE

Montgomery - Chapter 18 #49

18 Summary

<u>Category</u>	<u># of Questions</u>
Montgomery - Chapter 18	49