Unit Eleven Homework

1. This layer of gas protects life on earth from the sun's harmful ultraviolet radiation:
A) oxygen layer
B) carbon dioxide layer
C) ozone layer
D) CFC layer
E) nitrogen layer

2. This layer of the atmosphere contains gas that absorbs harmful ultraviolet light:
A) lithosphere
B) ionosphere
C) stratosphere
D) troposphere
E) hydrosphere

3. This group of chemicals breaks down in the upper atmosphere and destroy the gas that absorbs ultraviolet light; they are popular refrigerants:
A) ozone
B) chlorofluorocarbons
C) ammonia
D) alcohols
E) noble gases

4. Which of the following activities deplete the ultraviolet absorbing gas in the upper atmosphere?
A) chlorofluorocarbon release into the air
B) high flying aircraft release nitric oxide
C) release of bromine into the air
D) a and b only
E) a, b, and c

5. The greatest decline in the gas layer that absorbs ultraviolet radiation in the upper atmosphere occurs in winter months over:
A) New Mexico
B) Antarctica
C) New Zealand
D) Nova Scotia
E) Germany

6. Excessive exposures to ultraviolet radiation in humans can result in:
A) cataracts
B) skin cancer
C) immune system suppression
D) sun burns
E) all of the above

7. Chlorofluorocarbons take __ years to migrate to the upper atmosphere where they have their harmful effects.
A) 5

B) 10
C) 15
D) 20
E) 25

8. At least ___ years will be required to return ozone levels in the upper atmosphere back to 1985 levels.
A) 25
B) 50
C) 75
D) 100
E) 200

9. An acid is a chemical that adds _____ ions to a solution.
A) sodium
B) potassium
C) chloride
D) hydrogen
E) hydroxyl

10. Substances with a pH less than 7 are:
A) acidic.
B) basic.
C) neutral.
D) like water.
E) nonreactive.

11. A solution with a pH of 7 contains ___ times more hydrogen ions than a solution of pH 10.
A) 10
B) 100
C) 1000
D) 10,000
E) 100,000

12. A solution with a pH of 7 contains ___ times fewer hydrogen ions than a solution of pH 6.
A) 10
B) 100
C) 1000
D) 10,000
E) 100,000

13. The pH scale runs from:
A) 0-7
B) 0-10
C) 0-14
D) 1-10
E) 1-14

14. The pH of “pure” rain would be approximately:
A) 3.5
B) 5.7
C) 7.0
D) 8.5
E) 9.0

15. The pH of rain in unpolluted areas is slightly acidic because it has some ____ dissolved in it.
A) oxygen
B) nitrogen
C) water vapor
D) carbon dioxide
E) sulfuric acid

16. Wet deposition refers to acids deposited by:
A) particulates falling to earth.
B) rain and snow
C) ocean spray
D) automobile exhaust
E) animal metabolism

17. Dry deposition refers to acids deposited by:
A) particulates falling to earth.
B) rain and snow.
C) ocean spray.
D) automobile exhaust.
E) animal metabolism.

18. Sulfur oxide and sulfates can combine with water to form:
A) carbonic acid
B) sulfuric acid
C) nitric acid
D) hydrochloric acid
E) muriatic acid

19. Natural sources of sulfur dioxide include:
A) forest fires
B) volcanoes
C) power plants
D) a and b only
E) a, b, and c

20. About ___% of all sulfur dioxide comes from electric power plants that burn coal.
A) 15
B) 35
C) 50
D) 70
E) 90

21. Chemical substances that resist change in pH are called:
A) acids
B) bases
C) alkali
D) buffers
E) salts

22. Acid deposition affects aquatic systems by:
A) killing aquatic organisms.

B) impairing reproduction.
C) impairing growth.
D) increasing the concentration of metals in the water.
E) all of the above

23. Acid deposition is damaging to trees because it:
A) impairs germination of some species.
B) damages the leaves.
C) may affect the root systems of trees.
D) a and b only
E) a, b, and c

24. Acid deposition is damaging to crops because it:
A) damages the leaves.
B) may impair growth.
C) may impair photosynthesis
D) may alter the soil
E) all of the above

25. The 1990 amendments to the Clean Air Act require that by the year 2010 sulfur dioxide emissions are to be ___% below 1980 levels.
A) 20
B) 40
C) 60
D) 80
E) 95

26. International efforts to control sulfur dioxide emissions rely on which of the following strategies?
A) Installation of scrubbers on new and existing coal-fired power plants.
B) Combustion of low-sulfur coal or natural gas in utilities.
C) Combustion of desulfurized coal.
D) a and b only
E) a, b, and c

27. Which of the following strategies will reduce acid deposition from air pollution?
A) Using fuel efficiently.
B) Using renewable fuels.
C) Stabilizing population growth.
D) Growth management.
E) all of the above

28. Much of the sunlight reaching the earth and its atmosphere is converted into heat and is eventually radiated:
A) back into space.
B) back to the earth.
C) into the air.
D) and absorbed by ocean water,
E) and absorbed by living organisms.

29. Heat is called _____ radiation.
A) ultraviolet
B) ionizing
C) nuclear

D) infrared
E) gamma

30. Chemical substances that increase the Earth's surface temperature are called:
A) heat sinks
B) fuels
C) greenhouse gases
D) anthropogenic factors
E) particulates

31. Which of the following substances is involved in warming the earth's atmosphere?
A) water vapor
B) carbon dioxide
C) nitrous oxide
D) methane
E) all of the above

32. Which of the following substances are <u>not</u> involved in warming the earth's atmosphere?
A) methane
B) chlorofluorocarbons
C) carbon dioxide
D) nitrous oxide
E) helium

33. The trapping of heat within the Earth's atmosphere by various pollutants is called the:
A) photoelectric effect.
B) Coriolis effect.
C) Gaia effect.
D) greenhouse effect.
E) Doppler effect.

34. The largest single contributor to global warming in the atmosphere is:
A) chlorofluorocarbons
B) methane
C) nitrous oxide
D) carbon dioxide
E) ozone

35. Which of the following is a source of methane in the atmosphere?
A) wetlands
B) rice fields
C) fossil fuels
D) livestock
E) all of the above

36. Scientists from the IPCC recently predicted a __ degree C increase in the average global temperature by 2100.
A) 0.5 -0.7
B) 1.8-4
C) 2.7-11
D) 3.4-12
E) 4.0-6.8

37. Which of the following responses is a possible effect of global warming?
A) Raising sea levels.
B) Rainfall patterns could change.
C) River flows and groundwater could decrease in some areas.
D) The number and severity of storms could increase.
E) all of the above

38. Deforestation is responsible for about _____of the annual global increase in carbon dioxide.
A) one-eighth
B) one-fourth
C) one-third
D) one-half
E) two-thirds

39. Which of the following containers consumes the least amount of energy per use?
A) aluminum can, used once
B) recycled steel can
C) glass bottle, used once
D) recycled glass bottle
E) refillable glass bottle, used 10 times

40. Which of the following activities would be expected to reduce atmospheric carbon dioxide levels?
A) Constructing new coal burning power plants.
B) Replanting large sections of tropical rainforest.
C) Harvesting more timber for wood and paper production.
D) Decreasing the fuel efficiency of automobiles.
E) Allowing the world population to continue to increase at the current rate.

True/False
41. Chloroflurocarbon molecules can destroy ozone molecules in the atmosphere.

42. Ozone screens out 50% of the sun's harmful ultraviolet radiation.

43. Ultraviolet radiation is potentially harmful to life on earth.

44. Freon-12 is used in refrigerators and air conditioners as a refrigerant.

45. The ozone layer in the atmosphere is also called the ionosphere.

46. Carbon tetrachloride is an ozone-depleting solvent that was once widely used.

47. The highest level of ozone depletion on Earth occurs over the North Pole.

48. Excess ultraviolet radiation can cause skin burns, cataracts and skin cancer.

49. Phytoplankton are not effected by increased ultraviolet radiation levels.

50. It will take 100-200 years for the ozone layer to fully recover from current damage.

51. An acid is a substance that adds hydrogen ions to a solution.

52. Acidity is measured on the Rockwell scale.

53. Wet deposition refers to the evaporation of water from lakes and rivers.

54. Acidity in the soil can cause the leaching of heavy metals from the soil into surface water.

55. About 70% of all anthropogenic sulfur dioxide comes from electric power plants.

56. Baking soda and lime are very acidic substances.

57. Rain with a pH of 4 is 10 times more acidic than rain with a pH of 5.

58. The ozone layer is a nonrenewable form of protection that converts harmful ultraviolet radiation into heat.

59. Most CFC s released in the atmosphere come from natural sources like volcanoes and evaporation.

60. Acid deposition from pollutants is a local problem causing very limited and minimal social, economic and environmental impacts.

Fill-in-the-Blank

61. The pH scale ranges from 0 to ___.

62. The pH value indicating a neutral solution is ___.

63. ___ deposition refers to acids deposited in rain and snow.

64. ___ deposition occurs when air pollutants settle out of the atmosphere.

65. _____ are chemical substances that allow aquatic systems to resist changes in pH.

66. _____ interferes with normal calcium deposition in bird eggs resulting in soft eggshells.

67. Acid deposition may damage the foliage and ____ of plants.

68. Approximately _____ of the sunlight striking the Earth and its atmosphere is reflected back into space.

69. Carbon dioxide molecules in the atmosphere absorb _____ radiation escaping from the Earth's surface and radiate it back to the Earth.

Unit Eleven Homework

70. The trapping of heat within the Earth's atmosphere by pollutants is called the _____ effect.

71. The four most important gases involved in global warming are: carbon dioxide, chlorofluorocarbons, nitrous oxide and _____.

72. One molecule of CFC is equivalent to _____ molecules of carbon dioxide.

73. In 1987, 24 nations signed a treaty called the _____ Protocol that would cut production of five CFCs by half by 1999.

74. The ozone layer extends from 10 to __ miles above the Earth's surface.

75. The ozone layer is threatened by the use of CFCs and ___ travel through the atmosphere.

76. All jets release _____ gas that can react with ozone in the upper atmosphere.

77. In small amounts, _____ radiation tans the skin and stimulated vitamin D production.

78. The greatest declines in ozone have been recorded over _____ and the southern tip of Argentina.

79. CFCs are being replaced by a class of compounds called _____ that are much less damaging to atmospheric ozone.

80. The most widely used CFC is Freon-___.