UNIT TWO HOMEWORK

1. The largest biological system is the:
A) atmosphere
B) lithosphere
C) ionosphere
D) biosphere
E) stratosphere

2. The process where plants use sunlight to produce carbohydrates from carbon dioxide is called:
A) photosynthesis
B) respiration
C) nitrogen fixation
D) ATP production
E) biological oxidation

3. Terrestrial areas on earth containing specific chemical and physical conditions allowing survival of a specific assemblage of organisms is called a:
A) ecosystem
B) biosphere
C) biome
D) niche
E) cline

4. This biome contains grasses, mosses, lichens, wolves, musk oxen and arctic fox:
A) chaparral
B) taiga
C) tundra
D) boreal forest
E) deciduous forest

5. The conversion of nitrogen to ammonia is called:
A) eutrophication
B) decomposition
C) nitrogen fixation
D) denitrification
E) acidification

6. This substance can be converted by cyanobacteria in the soil to ammonia?
A) carbon dioxide
B) oxygen
C) nitrogen
D) water

7. The layers of different color and composition of a soil are called the:
A) soil strata
B) soil sample
C) soil profile
D) soil test
E) soil compaction

8. The uppermost layer of the soil is the:
A) A horizon
B) B horizon
C) C horizon
D) D horizon
E) O horizon

9. The average rate of erosion on U.S. farmland is approximately ____ times greater than the X nutrients leached from above:
A) 2
B) 3
C) 5
D) 7
E) 10

10. Irrigation must be done carefully because it can cause:
A) wind erosion and fertilization
B) drought and desertification
C) insect infestation and fungal growth
D) waterlogging and salinization
E) lowered water tables and toxic pollution

11. Planting crops perpendicular to the slope of the land is called:
A) strip cropping
B) contour farming
C) terracing
D) gully reclamation
E) crop rotation

12. Trees planted along the perimeter of crops to reduce wind erosion are called:
A) wind rows
B) shelterbelts
C) waterways
D) reforestation
E) riparian vegetation

13. The loss of water from the soil and leaves is:
A) evaporation
B) transpiration
C) evapotranspiration
D) sublimation
E) condensation

14. Precipitation falls to earth in which of the following forms?
A) rain
B) snow
C) sleet
D) hail
E) all of the above

15. Chesapeake Bay on the eastern coast of the U.S. is a/an:
A) lake
B) freshwater marsh
C) estuary
D) river system
E) tidal flat

16. Mangrove swamps, salt marshes, bays, and lagoons are:
A) tidal areas
B) inland wetlands
C) coastal wetlands.
D) estuaries
E) freshwater marshes

17. Today less than _____ of America's wetlands remain.
A) one-eighth
B) one-fourth
C) one-third
D) one-half
E) three-fourths

18. This aquatic habitat is found at the mouths of rivers and are important life zones:
A) bayou
B) swamp
C) estuary
D) bog
E) lagoon

19. Over ____% of the estuarine zone in the U.S. has been destroyed.
A) 10
B) 20
C) 30
D) 40
E) 50
Answer: D

BOTKIN

20. The region of the Earth where life exists is known as:
    a) the biota
    b) the crust
    c) the biosphere
    d) the biozone
    e) Gaia

21. Uniformitarianism is:

a) the principle that everything affects everything else

b) a New England religion, the first to become active in environmentalism

c) the principle that the past can be understood by studying the processes operating at present

d) the belief that the Earth functions as a single living organism

e) the principle that differences within the environment are small relative to the overall similarities

22. The following chemical equation describes which process:

$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

a) photosynthesis

b) oxidation

c) pyrolysis

d) respiration

e) carbonation

23. The nitrogen cycle is one of the most important biogeochemical cycles. However, molecular nitrogen (N_2) in the atmosphere is not a significant element for life because:

a) almost all nitrogen is in the atmosphere and therefore unavailable to life

b) organisms use either CO_2 or O_2 but not nitrogen

c) N_2 is relatively inert and must be transformed in order to be useful

d) where nitrogen is insufficient, organisms can use other, more plentiful nutrients

e) nitrogen is an important nutrient, necessary for life

24. The hydrologic cycle refers to the recycling of:

a) surface

b) groundwater

c) rain water

d) ocean water

e) all water

25. The rock cycle depends on the _____ cycle to lift mass above sea level and the _____ cycle to supply the force of erosion.
    a) solar; oceanic
    b) tectonic; hydrologic
    c) nuclear, biogeochemical
    d) solar; hydroelectric
    e) tectonic; carbon

26. Assume that a lake contains 12,000,000 m^3 of water, the evaporation rate is 4000 m^3/day, and surface runoff is 4000 m^3/day. Calculate the average residence time of the water in the lake.
    a) 3000 days
    b) 82,000 hrs
    c) 8.1 years
    d) 82,000 hrs and 8.1 years
    e) 3000 days and 8.1 years

27. The geographic distribution of living things is called:
    a) biogeographic province
    b) biome
    c) biotic province
    d) biosphere
    e) biogeography

28 Grasslands with scattered trees are known as _____.
    a) temperate shrub lands
    b) wetlands
    c) tropical rain forests
    d) tropical savannas
    e) temperate forests

29 The _____ biome includes regions such as estuaries, rivers, and lakes.

a) intertidal
b) fresh waters
c) hydrothermal vents
d) wetlands
e) benthos

30 In the _____ biome, typical vegetation may include small trees such as mangroves, shrubs, sedges, and mosses. Animals may include mammals, reptiles, snakes, birds, as well as invertebrates such as crabs or clams.

a) intertidal
b) fresh waters
c) hydrothermal vents
d) wetlands
e) benthos

31 _____ are treeless plains in areas of low annual temperatures and low rainfall.

a) Temperate grasslands
b) Benthos
c) Taiga
d) Deserts
e) Tundra

32 _____ include prairies of North America, steppes of Eurasia, plains of Africa, and the pampas of South America.

a) Temperate grasslands
b) Benthos
c) Taiga
d) Deserts
e) Tundra

33 The leading human cause(s) of desertification is/are:

a) global warming
b) conversion of rangelands to croplands in marginal areas
c) poor forestry practices
d) failure to use contour plowing
e) all of these

34 Which of the following is not a major symptom of desertification?

a) lowering of the water table
b) increased salt content of the soil
c) increased soil erosion
d) loss of natural native vegetation
e) pollution by sediment, fertilizers, and pesticides

35 Practices that can sustain the fertility of soils include all of the following except:

a) plowing in the fall
b) plowing up and down slopes to channel runoff away quickly
c) multiculture
d) strip cropping
e) crop rotation

36 Poor agricultural practices commonly lead to loss of soil fertility over time. The rate of that loss is commonly measured as:

a) the time required for the soil to lose one half of its original storage of chemical nutrients
b) the degree of molecular disorder of the chemical elements necessary for crops
c) the ratio of crop production to the amount of chemical residue after each production period
d) the number of years it for crop land to restore depleted chemical elements
e) the amount of chemical fertilizer necessary for crops per production unit per year

37 What is the main common feature of a wetland:

a) it is wet all year round
b) it has little variation in water temperature over the course of the year
c) it is wet part or all of the year

d) the duration of inundation depends on the precipitation

e) the wetland soil is characterized by sufficient oxygen

38 The top 1 km of the Earth's crust contains an estimated 2 x 10^{12} metric tons of silver, equal to hundreds of millions times the average consumption of the metal. The main reason that silver remains a valuable and relatively scarce material is its low:

a) concentration

b) market price

c) abundance

d) depth

e) density

39 All of the following are geologic processes that form mineral deposits listed in the Environmental Science textbook except:

a) biological processes

b) igneous processes

c) sedimentary processes

d) radiational processes

e) weathering processes

40 An ore deposit formed by weathering processes:

a) bauxite

b) an evaporite

c) a placer deposit

d) phosphate

e) none of these

41 On average, each person in the United States uses _____ of new mineral materials each year (excluding energy resources).

a) 20 lbs (0.01 tons)

b) 200 lbs (0.1 tons)

c) 2000 lbs (1.0 tons)

d) 20,000 lbs (10 tons)

e) 200,000 lbs (100 tons)

42 Which of the following is not a major way in which ore deposits typically form:

a) secondary enrichment associated with weathering processes
b) chemical precipitation from seawater
c) enrichment by selective chelation
d) sorting of sediments during transport by streams
e) by the movement of magma and high-temperature fluids

43 The largest non-energy-related mineral industry in the United States is:

a) gold, silver, and platinum mining
b) iron mining
c) sand and gravel
d) limestone quarrying
e) salt recovery

44 Which of the following minerals can be precipitated by processes involving living organisms:

a) sodium and gypsum
b) magnesium and gypsum
c) calcium and iron
d) iron and magnesium
e) calcium and magnesium

45 The combination of _____ mobilizes metals in magmas.

a) heat, crystallization and partial melting
b) crystallization, cooling and temperature decline
c) heat, pressure and partial melting
d) seismicity, temperature and pressure
e) convection, seismicity and partial mixing

46. Which of the following is not a step in the global nitrogen cycle?
A. nitrogen fixation
B. nitrification
C. photosynthesis
D. ammonification
E. denitrification

47. Populations are most critically limited by all of the following reasons EXCEPT
A. available food.
B. suitable shelter from the elements.
C. available water.
D. suitable shelter from predators.
E. micronutrients.

48. Primary succession occurs when a community develops _____ while secondary succession occurs
when one _____.
A. into a climax community, species replaces another
B. and replaces another, ecosystem becomes stable
C. on unoccupied ground, biological community replaces another
D. and then fails, niche changes
E. intraspecific competition, experiences interspecific competition

49. Which of the following are pioneer species?
A. wood warblers
B. dandelions
C. starlings
D. lichens
E. humans

50. A biome is described by
A. a specified bioregion.
B. broadly similar environmental conditions.
C. a watershed divide, generally.
D. geographic location.
E. large landforms in the area.

51. All of the following are examples of a specialization that plants in the desert may have EXCEPT
A. storing water in stems or roots
B. reducing water loss with thick epidermal layers
C. shedding leaves in the driest seasons
D. using spines for shade
E. large leaves facing the sun.

52. Deserts are characterized by
A. an absence of vegetation.
B. sand dunes, which cause plants to grow only with difficulty.
C. low levels of measurable precipitation.
D. their location at 30° latitude.
E. sand or gravel.

53. Most of the world's grasslands are found
A. in North America.
B. on relatively dry continental interiors.
C. on the moist edges of continents.
D. in narrow strips on the edges of mountains.
E. along major river systems.

54. Tundra biomes occur
A. at high latitudes, where temperatures are low.
B. where rainfall is too great for tree growth.
C. only at high latitudes.
D. almost exclusively on Antarctica.
E. at high latitudes and altitudes, where the growing season is short.

55. Morpheus has been led into a wilderness environment and left to fend for himself for the summer. Luckily, he has a good coat because it looks like there may be a frost during the night and the mosquitoes are everywhere. As he looks around, he is relieved because he recognizes some of the plants. There are some mosses, lichens, small shrubs, sedges, and grasses. Which biome is he in?
A. tropical rainforest
B. wetland
C. temperate rainforest
D. tundra
E. coastal area

56. The word "conifer" distinguishes plants that are
A. needle bearing.
B. cone bearing.
C. evergreen.
D. coneshaped.
E. found in northern latitudes.

57. Having needle shaped leaves benefits plants because needles
A. reduce water loss and endure cold winters.
B. are more efficient at photosynthesis because they are dark green.
C. evaporate water more efficiently.
D. do not rot in the excessive rainfall that characterizes coniferous forests.
E. are less resistant to strong winds.

58. Trinity and Neo are in an area that has many lakes and bogs. There are also plants that indicate an acid soil. As they look around, the deciduous trees they see are birches, aspens, and maples. What forest are they in?
A. temperate rainforest
B. boreal forest
C. tropical rainforest
D. southern pine forest
E. coastal forest

59. Boreal forests are generally
A. cold and dry, with extensive barren areas.
B. warm and humid, with large rivers.
C. dry because water is frozen most of the year.
D. cool and moist, with many streams and wetlands.
E. soggy in the summer because of permafrost.

60. Deciduous forests
A. are adapted to extremely cold climates.
B. have trees that bear seeds in cones.
C. have trees that shed their leaves seasonally.
D. are not useful commercially.
E. are not found in the African continent.

61. Cloud forests are found in _____ areas in tropical regions.
A. hot coastal
B. cool mountainous
C. cool plains
D. low elevation
E. valley

62. Neo is on a mission for the truth. Part of his assignment is to travel to a boreal forest and talk with the leader of an indigenous tribe. He was kidnapped by agents and as he wakes he finds himself sweating in a moist forest but there aren't many streams or wetlands. He is amazed by the tremendous amount of biodiversity including an abundance of biting mosquitoes. Has he inadvertently gotten closer to his goal of finding a boreal forest?
A. Yes
B. No the description is that of a tropical seasonal forest.
C. No the description is that of a temperate deciduous forest.
D. No the description is that of a tropical rainforest.
E. No the description is that of a temperate rainforest.

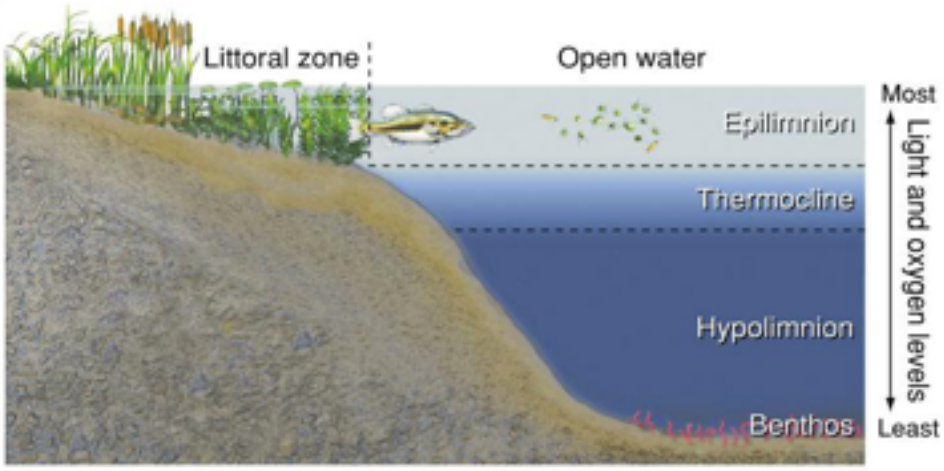
63. Tropical moist forests have high species diversity because
A. they are complex, with many diverse niches.
B. they are larger than any other biome type.
C. due to heat and humidity, evolution has gone on faster there than in colder regions.
D. there has been little history of human settlement in the rainforests compared to Europe.
E. the warmer climate makes it less harsh for species to survive.

64. A biome absent from North America is the
A. temperate deciduous forest.
B. alpine tundra.
C. desert.
D. tropical rainforest.
E. temperate rainforest.

65. Which of the following protects mainland shores form the force of waves?
A. wetlands
B. barrier islands
C. coral islands
D. estuaries
E. volcanic islands

66. The thermocline is the layer in a lake at which
A. pollutants are trapped and held.
B. seasonal lake mixing occurs.
C. the warm upper zone meets the cold lower zone.
D. nutrient levels are the lowest.
E. light no longer penetrates enough for photosynthesis to occur.

67. Wetlands are biomes that
A. are wet all year round.
B. are wet at least some of the year.
C. have fresh, not salty, water.
D. receive more rainfall than other ecosystems.
E. have salty, not fresh water.

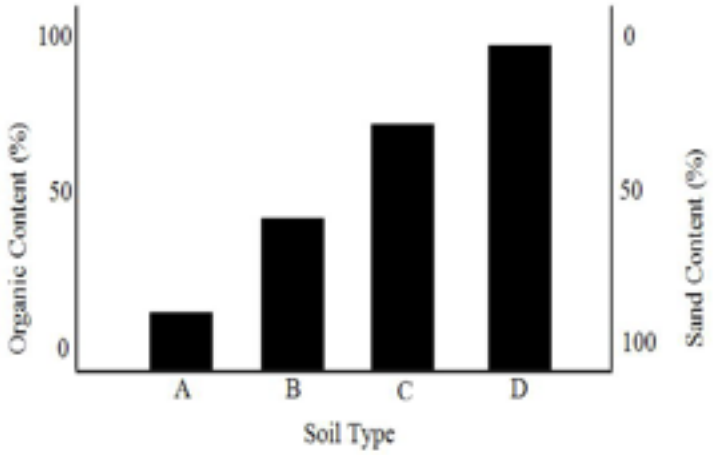


68. Referring to the above figure, which of the following statements is false?
A. Deeper layers of a lake are characterized by less light than are shallow areas of a lake.
B. Light has a direct relationship with depth.
C. The thermocline separates the epilimnion from the hypolimnion.
D. More dissolved oxygen exists in the epilimnion than in the benthos.
E. There is an inverse relationship between depth and the level of dissolved oxygen in a lake.

69. Refer to the above figure, Darrell reaches his hand into a lake and decides that it is warm enough in which to swim. Next, his friend James jumps into the lake and immediately decides that the lake is too cold. Which feature of a lake might explain Darrell and James difference of opinion?
A. The littoral zone is characterized by aquatic plants
B. The thermocline separates the epilimnion from the hypolimnion
C. The benthos hosts anaerobic bacteria.
D. The level of dissolved oxygen is greater at the surface than on the bottom.
E. Aquatic animals are found in both the littoral zone and open water

70. Mineral particles in the soil are derived from
A. underlying bedrock.
B. materials transported and deposited by glaciers.
C. materials transported and deposited by rivers.
D. materials transported and deposited by wind.
E. decaying plant and animal matter

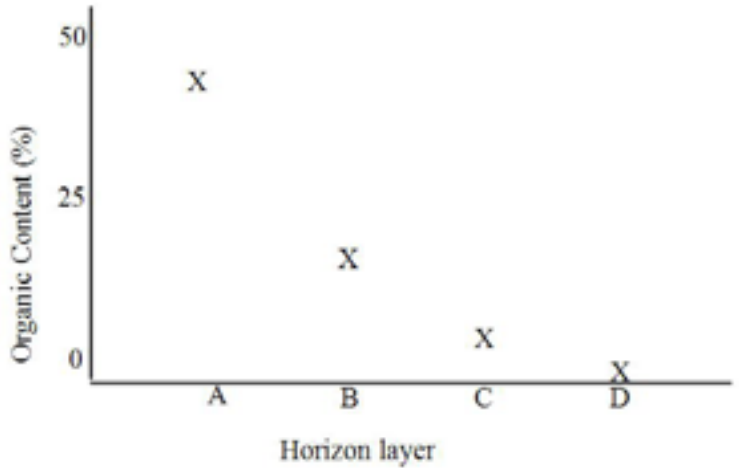
71. A "heavy" soil would have a high _____ content.
A. sand
B. iron
C. silt
D. clay
E. gravel



72. In the graph above, which soil type has the highest sand content?
A. A
B. B
C. C
D. D
E. It is impossible to tell with the provided data.

73. In the graph above, which soil type has the most pore space between the soil particles?
A. A
B. B
C. C
D. D
E. It is impossible to tell with the provided data.

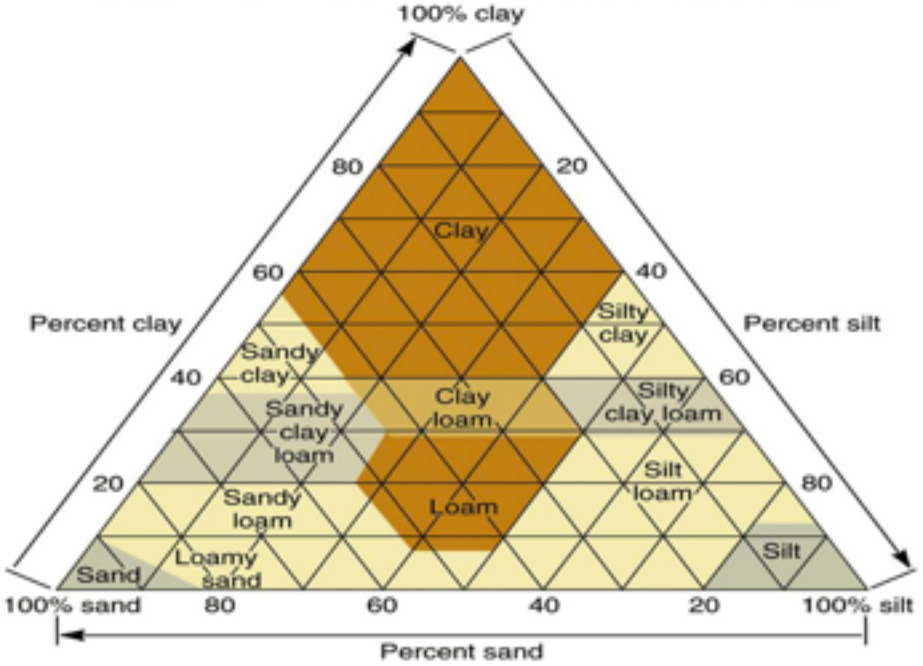
74. The stratified horizontal layers of soils are called
A. soil profiles.
B. soil horizons.
C. soil textures.
D. soil types.
E. soil classifications.



75. In which horizon layer of the graph above would you find the most plant roots?
A. A
B. B
C. C
D. D
E. It is impossible to tell with the provided data.

76. Which of the following are forms of chemical deterioration of soil?
A. salinization and acidification
B. waterlogging and laterization
C. compaction and nutrient depletion
D. pollution and waterlogging
E. water and wind erosion

77. Which is the best cropping method for reducing erosion?
A. rotating corn, wheat, and clover
B. growing corn continuously
C. growing wheat continuously
D. growing clover continuously
E. growing corn and wheat at the same time



78. A sample of soil is evaluated to determine the texture and is found to have 40% sand, 10 % silt and 50% clay. Classify the type of soil according to the figure above.
A. Clay
B. Loam
C. Silt
D. Silt loam
E. Clay loam

79. The U.S. Fish and Wildlife Service estimates that _____ of all endangered species spend at least part of their lives in wetlands.
A. 100%
B. half
C. onethird
D. onehalf
E. 10%

80. The basic material of rocks is a cohesive group of
A. one or more minerals.
B. any noncrystalline elements.
C. one or more inorganic elements.
D. a metal and a crystal.
E. one or more organic elements.

81. Rocks are _____ in the process called the rock cycle.
A. moved from place to place
B. incorporated into living organisms
C. broken down and reformed
D. cycled through the core and mantle
E. cycled through the crust and core

82. _____ is an example of an igneous rock.
A. Basalt
B. Shale
C. Marble
D. Sandstone
E. Limestone

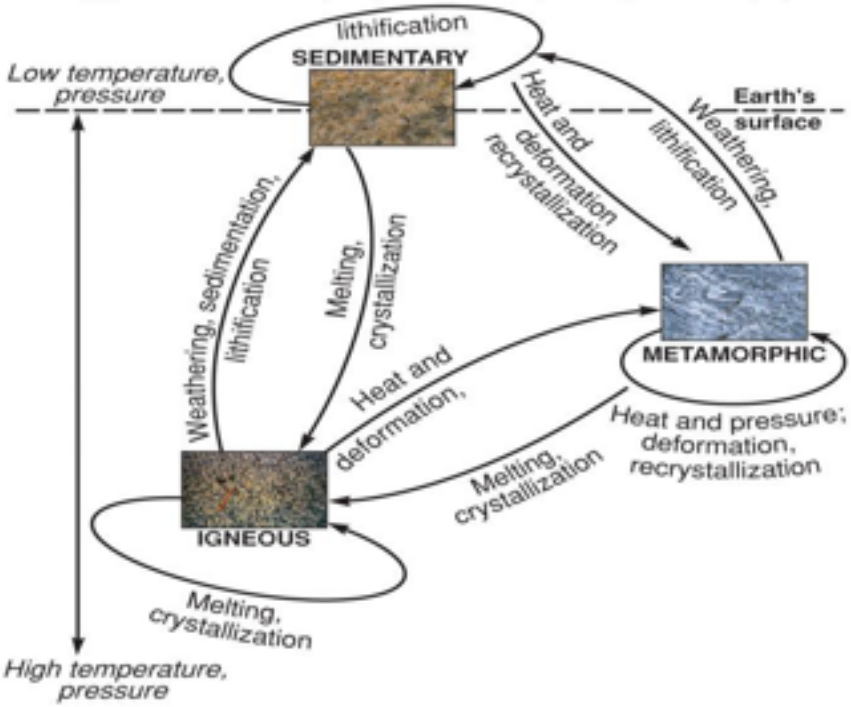
83. Water, wind, and glaciers are examples of forces that cause
A. chemical weathering.
B. mechanical weathering.
C. abrasion.
D. sedimentation.
E. metamorphosis in rocks.

84. The selective removal or alteration of specific components of a rock that leads to its weakening is called
A. the rock cycle.
B. sedimentation.
C. chemical weathering.
D. mechanical weathering.
E. abrasion.

85. The physical breakdown of a rock into smaller pieces is called
A. the rock cycle.
B. sedimentation.
C. chemical weathering.
D. mechanical weathering.
E. abrasion.

86. Metamorphic rocks are produced when rocks are
A. chemically weathered.
B. recrystallized by heat and pressure.
C. physically broken down.
D. melted in the mantle and recrystallized.
E. recrystallized through chemical processes.

87. _____ is an example of metamorphic rock.
A. Basalt
B. Shale
C. Marble
D. Sandstone
E. Granite



88. Which of the following statements is false?
A. Heat and deformation cause metamorphic rock.
B. Melting and crystallization cause igneous rock.
C. Weathering, sedimentation and lithification cause sedimentary rock.
D. Sedimentary rocks occur mainly deep within the earth's crust.
E. It's impossible for metamorphic rock to form on the surface.

89. According to figure above, which types of rock are formed under the earth's surface?
A. sedimentary
B. metamorphic
C. igneous
D. both sedimentary and igneous
E. both metamorphic and igneous

90. Evaporation is
A. the way plants absorb water.
B. liquid water turning to vapor well below boiling temperature.
C. liquid water boiling to produce water vapor.
D. the way water seeps into the ground.
E. the process of water becoming a liquid at a lower temperature.

91. Natural evaporation processes are mainly driven by
A. living plants.
B. radiative heat from the ground.
C. solar energy.
D. the natural instability of liquid water.
E. radiative heat from the Earth's core.

92. The city of Arcata, California, is notable because it designed a _____ to treat its sewage.
A. system of modern outhouses
B. fully modern, technologically advanced system
C. natural marsh
D. corporate sponsorship system
E. living machine

93. Wetland protection is one of the most controversial provisions of the _____ because opponents believe that the legislation is _____
A. Endangered Species Act; an infringement on their use of private property
B. Clean Water Act; ineffective because it does not prevent pollutants
C. Land Use Act; an infringement on their use of private property
D. Clean Air Act; ineffective because it does not prevent pollutants
E. Clean Water Act; an infringement on their use of private property