Multiple Choice Questions

1. In its most general sense, climate is _______________.
   a. based on vegetation types alone
   b. a model of reality that is too simplistic to be useful
   c. the average weather of a region
   d. a reflection of solar insolation values and placement in relationship to tidal action

2. What two major factors influence the annual cycle of air temperature experienced at a station?
   a. latitude and longitude
   b. longitude and location in relationship to the coast
   c. latitude and coastal versus continental location
   d. annual solar insolation and latitudinal coastal location

5. In contrast to the equatorial temperature regime, the tropical continental temperature regime is characterized by _______________.
   a. uniform temperatures all year round
   b. a high annual variation in solar insolation
   c. no annual variation in solar insolation
   d. a very strong temperature cycle

6. The tropical desert climates are caused by _______________.
   a. a lack of moisture
   b. their placement in relationship to the Prime Meridian
   c. their distance from the equator and the Arctic circle
   d. stationary subtropical cells of high pressure

8. Monthly patterns of precipitation are typified by three types: 1) uniformly distributed precipitation, 2) a precipitation maximum during the high-Sun season, and 3) _______________.
   a. a precipitation maximum during the late low-Sun season
   b. a precipitation minimum during the late high-Sun season
   c. a precipitation maximum during the low-Sun season.
   d. a precipitation minimum during the early high-Sun season

9. In Mediterranean climates, summer ____________ is caused by _______________
   pressure cells.
   a. precipitation, subtropical high
b. precipitation, midlatitude low
c. drought, subtropical low
d. drought, subtropical high

15. A geographic feature common to dry climates is ______________.
   a. no permanently flowing streams
   b. a surface covered with dry lakes
   c. a complete lack of precipitation
   d. high surface winds

16. Semiarid climates are noted for ________________.
   a. a complete lack of vegetation
   b. a surface covered with dry lakes
   c. steppes with sparse grasslands
   d. high surface winds

17. Wet equatorial climates ________________.
   a. are significantly influenced by the ITCZ
   b. are dominated by warm, moist mE and mT air masses
   c. show no seasonal rainfall pattern
   d. a and b

18. The __________ air mass is drawn onshore over Asia during the summer monsoon season.
   a. mP
   b. cP
   c. cT
   d. mT

19. Dry tropical climates are generally located in the _______ and on the _________
    of subtropical high-pressure cells.
   a. center; west sides
   b. center; north sides
   c. center; south sides
   d. center; east sides

20. Dry tropical climates are driest near the ________________.
    a. equator
    b. tropic of Cancer
    c. tropics of Cancer and Capricorn
    d. tropic of Capricorn

21. A ________________ refers to a semiarid area where some grasses grow in response to a short wet season.
    a. desert
    b. prairie
c. grassland
d. steppe

23. The _________________ climate is renowned for its very scarce precipitation during the summer season.
   a. moist subtropical
   b. dry subtropical
   c. Mediterranean
   d. ice-sheet

24. The _______________ air masses are responsible for precipitation patterns in the moist continental climate.
   a. mT, cP, and mP
   b. mP, cT, and mT
   c. mT, cP, and cA
   d. cA, cP, and mP

True/False Questions

26. True/False   The wet equatorial climate receives its precipitation from convectional rainfall.

27. True/False   The wet-dry tropical climate is distinguished by a very dry season at low sun that alternates with a very wet season at high sun.

31. True/False   Boreal forest climates have short, cool summers and long, bitterly cold winters.

32. True/False   The Köppen climate classification system divides the world into seven major climate zones.

33. True/False   Warm air can hold more moisture than can cold air.

35. True/False   Annual temperature cycles are strong in the midlatitude continental regime.

37. True/False   A steppe is a vast expanse of semiarid grassland.

<Chapter 8: Biogeographic Processes>

Multiple Choice Questions

1. Within an ecosystem, energy transformations occur through a series of levels commonly referred to as the food web, within which plants and algae represent the _________________.

a. secondary producers  
b. primary consumers  
c. primary producers  
d. decomposers

3. During the nitrogen cycle, the process in which certain soil bacteria convert nitrogen from usable forms (NO$_x$) back to N$_2$ is called _______________.  
   a. nitrification  
   b. nitrogen fixation  
   c. denitrification  
   d. nitrogen consumption

6. The annual rhythm of leaf shedding by deciduous trees is a determined by:  
   a. light  
   b. heat  
   c. wind  
   d. moisture

7. Plants that adapt to drought conditions are:  
   a. tropophytes  
   b. epiphytes  
   c. xerophytes  
   d. hydrophytes

9. Which of the following is an edaphic factor important in differentiating habitat?  
   a. soil texture  
   b. time  
   c. light  
   d. all of the above

10. The phenomenon in which chemical toxins produced by one species serves to inhibit the growth of others is:  
    a. predation  
    b. allelopathy  
    c. parasitism  
    d. herbivory

11. Succession that occurs on a site that has been burnt in a forest fire is:  
    a. primary succession  
    b. secondary succession  
    c. tertiary succession  
    d. ecological succession

12. Pioneer species are:  
    a. well adapted to dry soil conditions  
    b. able to withstand temperature extremes
c. larger than other species that replace them
d. all of the above
e. a and b

13. The finch species on the Galapagos Islands are an example of:
   a. allopatric speciation
   b. sympatric speciation
   c. polyploidy speciation
   d. genetic drift

14. The process by which species are differentiated and maintained is:
   a. recombination
   b. mutation
   c. speciation
   d. variation

15. Which of the following is not a speciation process?
   a. mutation
   b. genetic drift
   c. natural selection
   d. extinction

16. The highest biodiversity on Earth is found in:
   a. tropical and equatorial regions
   b. midlatitude regions
   c. alpine regions
   d. subarctic and arctic regions

True and False Questions

21. True/False  Few plant and animal species are found in the equatorial rainforest.

22. True/False  Nitrogen in the form of N2 can be utilized directly by most organisms.

24. True/False  Cosmopolitan species are restricted to a single region or location.

25. True/False  Human activity is rapidly decreasing the Earth’s biodiversity.

30. True/False  Cold-blooded animals survive the winter period by becoming dormant.

<Chapter 9: Global Biogeography>

Multiple Choice Questions

1. Natural vegetation ____________________.
a. is a plant cover that develops with little or no human interference
b. is a plant cover that develops with no human interference
c. no longer exists as humans have affected every part of the globe’s surface
d. is an ideal state from which human modifications can be judged

2. ____________ are plant forms in which algae and fungi live together to form a single plant structure.
   a. Lianas
   b. Herbs
   c. Lichen
   d. Moss

3. The ______________ biome develops in regions with moderate shortages of soil water.
   a. forest
   b. savanna
   c. desert
   d. grassland

4. Which biome is represented by an open cover of trees with grasses and herbs underneath?
   a. forest
   b. desert
   c. grassland
   d. savanna

5. ____________ are plants that are well adapted to drought conditions.
   a. Sclerophylls
   b. Xerophytes
   c. Deciduous
   d. Evergreens

6. Of the following climates, which has a strong wet-dry alternation and many of the plants have xerophytic adaptations?
   a. Mediterranean
   b. tundra
   c. tropical
   d. polar

11. ______________, found in equatorial and tropical latitude zones, are very diverse, containing large numbers of plant and animal species.
   a. Low-latitude rainforest
   b. Monsoon forest
   c. Subtropical evergreen forest
   d. Needleleaf forest
12. Trees within the ____________________ occur in two forms: broadleaf and needleleaf.
   a. low-latitude forest
   b. monsoon forest
   c. midlatitude deciduous forest
   d. subtropical evergreen forest

13. Needleleaf forests are noted for _________________.
   a. their lack of species
   b. the low level of shade they provide
   c. evergreens that hold on to their needles for about a year
   d. poor quality pulp wood

14. Within the boreal forest of north-central and eastern Siberia, the dominant ________________ tree sheds its needles in winter and is thus a deciduous needleleaf tree.
   a. spruce
   b. pine
   c. larch
   d. cedar

15. According to a report issued by the United Nations Food and Agriculture Organization, __________ of the world’s rainforest is lost annually to other uses.
   a. five percent
   b. one percent
   c. ten percent
   d. less than one percent

16. The ________________ is dominated by low trees with thick, leathery leaves that are well-adapted to the long summer drought of the Mediterranean climate.
   a. deciduous forest
   b. coastal forest
   c. low-latitude rainforest
   d. sclerophyll forest

17. Plants of the ____________ grow, bloom and set seed during a short summer thaw following harsh cold winters.
   a. desert biome
   b. tundra biome
   c. grassland biome
   d. savanna biome

19. Within the grassland biome, ______________ are best developed in regions of midlatitude and subtropical zones with well-developed winter and summer seasons.
   a. tall-grass prairies
b. forbs
c. prairie grasslands
d. steppes

True/False Questions

22. True/False   Lianas are woody plants that take the form of vines.
23. True/False   Perennials are plants that live for a year and then die.
28. True/False   Animals, including insects, dominate any biome because of their large numbers.
30. True/False   Grazing by large mammals and periodic burning in the dry season help to maintain the openness of the savanna biome by suppressing tree seedlings.

<Chapter 10: Global Soils>

Multiple Choice Questions

1. Soil science, often referred to as _______________, involves a complex interaction between both chemical and physical processes.
   a. geomorphology
   b. pedology
   c. geology
   d. agronomy
2. Soil scientists use the term _______________ to describe finely divided, partially decomposed organic matter in soils.
   a. colloid
   b. peat
   c. organic residue
   d. humus
4. Soils of the Midwest prairies have a black or dark brown colour because they contain abundant particles of ________.
   a. peat
   b. humus
   c. magnesium
   d. iron
5. Soil colloids tend to be __________ charged because of their molecular structure, and thus attract and hold __________ charged plant nutrients such as __________.
   a. positively, negatively, \( \text{CO}_3^{2-} \) and \( \text{SO}_4^{2-} \)
   b. positively, negatively, \( \text{Ca}^{2+}, \text{Mg}^{2+}, \text{K}^{+} \) and \( \text{Na}^{+} \)
c. negatively, positively, $\text{Ca}^{2+}$, $\text{Mg}^{2+}$, $\text{K}^+$ and $\text{Na}^+$
d. negatively, positively, $\text{CO}_3^{2-}$ and $\text{SO}_4^{2-}$

6. High soil acidity is typical of ________ climates.
   a. cold, humid
   b. cold, dry
   c. warm, humid
   d. warm, dry

7. Soils with __________ lack soil structure peds.
   a. low clay content
   b. high clay content
   c. high sand content
   d. low sand content

8. __________ minerals in soils are compounds that remain from the unaltered rock while __________ minerals are formed by alteration.
   a. Parent, regolith
   b. Secondary, tertiary
   c. Primary, secondary
   d. Initial, subsequent

9. Surplus water stored in the soil usually __________.
   a. evaporates
   b. transpires
   c. undergoes evapotranspiration
   d. percolates down to the ground water zone

11. Soil must absorb an amount of water equal to the summer storage withdrawal before __________ begins.
   a. precipitation
   b. storage recharge
   c. water surplus
   d. evapotranspiration

12. The display of horizons on a cross section through the soil is termed a __________.
   a. soil profile
   b. soil strata chart
   c. soil layer
   d. soil condition

14. In ________ climates organic matter accumulates in soils while in comparison, it is relatively scarce in ________ climates.
   a. cold, warm
   b. dry, wet
c. warm, cold
d. wet, dry

16. Tundra soils fall largely into the order of ____________, soils with weakly developed horizons that are usually associated with a moist climate.
   a. Spodosols
   b. Andisols
   c. Inceptisols
   d. Histosols

17. _______________ are quite closely related to the Oxisols in outward appearance and environment of origin. They are reddish to yellowish in color.
   a. Spodosols
   b. Ultisols
   c. Mollisols
   d. Aridisols

18. ______________ typically form under grass and savanna vegetation in subtropical and tropical climates with a pronounced dry season.
   a. Vertisols
   b. Spodosols
   c. Mollisols
   d. Aridisols

20. Spodosols, formed in the cold boreal forest climate beneath a needle-leaf forest, have a unique property - a B horizon with a low capacity to hold ________________.
   a. humus
   b. water
   c. bases
   d. acids

**True/False Questions**

22. True/False The higher the temperature, the slower the decay process of organic soil components.

23. True/False Humus is finely divided, partially decomposed organic matter that either rests on the soil surface or is mixed through the soil.

26. True/False Soil texture refers to the proportion of particles that fall into each of three size grades: silt, talc, and clay.

28. True/False Highly acid soils (pH of eight or greater) are commonly found in cold, humid climates.
29. True/False   Aluminum oxide, bauxite, iron oxide, and limonite are all examples of secondary minerals.

<Chapter 11: Earth Materials>

Multiple Choice Questions

1. ____________, the predominant element of the Earth’s crust, accounts for almost ________ of the total percentage of weight.
   a. Iron, two-thirds
   b. Silicon, one-half
   c. Aluminum, one-quarter
   d. Oxygen, one-half

2. A ___________ is a naturally occurring, inorganic substance that usually possesses a definite chemical composition and characteristic atomic structure.
   a. crystal
   b. mineral
   c. rock
   d. metamorphic rock

3. ___________ can broadly be defined as an assemblage of minerals in the solid state.
   a. Sedimentary rock
   b. Igneous rock
   c. Metamorphic rock
   d. Rock

1. ___________ are formed from layered accumulations of mineral particles derived mostly by weathering and erosion of preexisting rocks.
   a. Sedimentary rocks
   b. Igneous rocks
   c. Metamorphic rocks
   d. volcanic rocks

5. Most igneous rock consists of silicate minerals, chemical compounds that contain ____________.
   a. silicon and fluorite compounds
   b. siliceous and nitrate type compounds
   c. silicon and oxygen atoms
   d. silver and oxygen atoms

6. Quartz and feldspar form a silicate mineral group described as _____________.
   a. mafic
   b. intermediate
   c. felsic
   d. siliceous
7. Igneous rocks solidify from rock in a hot, molten state, known as ________________.
   a. lava  
   b. molten rock  
   c. slag  
   d. magma

8. Intrusive igneous rocks are noted for their:
   a. large mineral crystals  
   b. interesting mineral composition  
   c. hardness, compared to extrusive igneous rocks  
   d. darker colors

9. A body of intrusive igneous rock is called a _____________.
   a. batholith  
   b. regolith  
   c. pluton  
   d. fracton

11. Near the Earth’s surface, a chemical alteration process known as ________________
    occurs when oxygen dissolved in soil or groundwater reacts with the minerals.
    a. hydrolysis  
    b. oxidation  
    c. dissolution  
    d. solution

12. ________________ sedimentary rocks are composed of weathered and eroded
    inorganic rock and mineral fragments.
    a. Chemically precipitated  
    b. Organic  
    c. Clastic  
    d. Plastic

13. Shale, the most abundant of all sedimentary rocks, is formed largely of
    ________________.
    a. clay minerals and silt  
    b. sand grains and gravel  
    c. talc  
    d. organic products

14. One of the most common sedimentary rocks formed by chemical precipitation is
    ________________, composed largely of the mineral calcite.
    a. Marble  
    b. Hornblende  
    c. Augite
d. Limestone

16. Natural gas is predominantly composed of _________.
   a. carbon dioxide
   b. ethane
   c. methane
   d. propane

17. __________ is formed from shale that is heated and compressed by mountain-making forces.
   a. Slate
   b. Quartzite
   c. Schist
   d. Marble

18. The metamorphic equivalent of conglomerate, sandstone and siltstone is _______________, which is formed by the addition of silica to fill completely the open spaces between the grains.
   a. slate
   b. quartzite
   c. schist
   d. marble

19. A high grade metamorphic rock that is strongly banded into light and dark layers is called a _____________.
   a. schist
   b. slate
   c. gneiss
   d. marble

<Chapter 12: The Lithosphere and Plate Tectonics>

Multiple Choice Questions

1. The theory describing the motions and changes through time of the continents and ocean basins, and the processes that fracture and fuse them, is called _____________.
   a. continental drift
   b. Earth dynamics
   c. plate tectonics
   d. the Wilson cycle

2. Enclosing the metallic core is the ____________, a rock shell about 2900 kilometers thick.
a. asthenosphere  
b. mantle  
c. moho layer  
d. lithosphere

3. The center of the Earth is occupied by the ___________ of about _________ kilometers in radius.  
a. mantle, 2900  
b. mantle, 3500  
c. core, 2900  
d. core, 3500

4. The upper layer of continental crust is made up of ___________ rock.  
a. mafic  
b. ultramafic  
c. felsic  
d. serpentine

5. Ocean bottom crust is made up almost entirely of ___________ rock.  
a. mafic  
b. ultramafic  
c. felsic  
d. serpentine

8. All time older than 570 million years (should be 542 Ma, NS) before the present is ___________ time.  
a. Cambrian  
b. Mesozoic  
c. Triassic  
d. Precambrian

11. The Caledonides and ______________ are both ancient mountain roots that formed some 250 million years ago.  
a. Appalachian Mountains  
b. Rocky Mountains  
c. Sierra Nevada Mountains  
d. Ural Mountains

14. Some continental margins are ___________ and accumulate thick deposits of continental sediments while other continental margins are ___________ and have trenches marking the location at which ocean crust is sliding beneath continental crust.  
a. passive; active  
b. active; passive  
c. passive; tectonic  
d. submerging, emerging
15. The large flat expanses of ocean floor between the continental margins and midocean ridges are called ________________.
   a. abysmal plains
   b. abyssal plains
   c. sea floor rises
   d. continental shelves

16. The process in which one plate is carried beneath another is called _____________.
   a. advection
   b. convection
   c. liposuction
   d. subduction

18. The San Andreas Fault forms a _________________ boundary between the Pacific plate and the North American plate.
   a. transform
   b. converging
   c. spreading
   d. subduction
20. Alfred Wegener, a German meteorologist and geophysicist, suggested in 1915 that the continents had once been adjoined as a supercontinent he named
   ____________.
   a. Wegener Land  
   b. Gondwanaland  
   c. Pangea  
   d. Laurasia

<Chapter 13: Volcanic and Tectonic Landforms>

Multiple Choice Questions

2. Which is not a force of denudation?
   a. waves and currents  
   b. glacial ice  
   c. tectonic processes  
   d. wind

5. The ____________ of the magma present within a volcano primarily determines whether the volcanic will erupt explosively or quietly.
   a. temperature  
   b. viscosity  
   c. pressure  
   d. chemistry

6. Occasionally, stratovolcanoes erupt so violently that the entire central portion of the volcano collapses into its empty magma chamber to subsequently form a water-filled volcanic lake called a __________.
   a. caldera  
   b. guyot  
   c. cinder cone  
   d. batholith

8. Rapid mixing of volcanic ash and the water produced by the flash melting of ice and snow that has accumulated at the tops of some dormant stratovolcanoes produces a deadly mud avalanche know as a(n) __________.
   a. debris flow  
   b. rock fall  
   c. lahar  
   d. mudslide

9. The chain of Hawaiian volcanoes was created by the motion of the ________ plate over a __________.
   a. Nazca, trench  
   b. Cocos, trench
11. There are basically two different forms of tectonic activity. These are ____________.
   a. compressional and extensional
   b. stressful and decompression
   c. decompression and extensional
   d. compressional and stressful

12. Compression leads to the folding of the crust which results in the formation of _________________.
   a. anticlines and synclines
   b. synclines and troughs
   c. upfolds and troughs
   d. troughs and anticlines

13. A __________ in the brittle rocks of the Earth’s crust occurs when rocks suddenly yield to unequal stresses by fracturing.
   a. break
   b. fault
   c. crack
   d. scarp

15. A narrow block dropped down between two normal faults is a _________________.
   a. horst
   b. graben
   c. deep valley
   d. shallow valley

16. __________ faults result in crustal shortening produced by compression of the crust.
   a. Normal
   b. Transcurrent
   c. Strike-slip
   d. Reverse