The cell wall is tough, flexible and fairly rigid layer that surrounds some types of cells. It is located outside the cell membrane and provides cells with structural support and protection. All BUT ONE type of organism has cells with cell walls. That is a(n)

A) animal.
B) bacteria.
C) fungus.
D) plant.
Which organisms would be the prey for the hawk?

A) rabbit, shrew, and snake
B) rabbit, snake, and grasshopper
C) shrew, snake, and insect eating bird
D) grass, rabbit, and insect eating bird
Through the miracles of medicine and technology, researchers have had some success with growing and transplanting hollow, relatively simple organs such as tracheas and bladders. Building solid organs like the kidneys or complex organs like the heart have proved to be much more difficult.

Considering how the body is organized, give one reason why it is so difficult for scientists to build a heart.

A) The heart is a pump made of muscle and that is difficult to grow in the lab.
B) Even if researchers build a heart, there is no guarantee that a person's body will accept it.
C) Human hearts are not like any other animal hearts so there is not source for cells and tissues.
D) The heart is made up of many different types of cells that are organized into different tissues.

4) What is NOT needed by all cells?
   A) food
   B) water
   C) sunlight
   D) a way to get rid of waste
5) A taiga biome is DIFFERENT from a tundra biome because it has
   A) many coniferous trees.
   B) cold winters and cool summers.
   C) located in the northern hemisphere.
   D) a layer of frozen soil called permafrost.

6) No matter which biome we examine, there is ALWAYS one group of organisms that is the nonmobile base for the biome's food web:
   A) animals.
   B) bacteria.
   C) plants.
   D) soil.

7) An olympic runner prepares to run a 100 meter race. Which of the body systems listed will probably be LEAST involved in the 1 meter race?
   A) circulatory
   B) muscular
   C) reproductive
   D) skeletal
8) Habitat ________ splits ecosystems into pieces and makes populations more vulnerable to disturbances or climate change.
   A) diversification
   B) extinction
   C) fragmentation
   D) unification

9) The projections on the cell's outer membrane allow for rapid movement. These projections are called
   A) cilia.
   B) flagella.
   C) micronuclei.
   D) pili.

10) In cells, the production of proteins is handled by the ribosomes and endoplasmic reticulum, while the processing and packaging of proteins is handled by the ________ body.
    A) Golgi
    B) nuclear
    C) plastid
    D) cytoplasmic
11) The image shown is a picture taken of plant stem cells using a light microscope. The stem cells of plants have an unusual tubular structure unlike most other types of plant cells. What function of plant stem cell related to their shape and structure?
   A) communication
   B) photosynthesis
   C) protection
   D) transport

12) Some species of nitrogen-fixing bacteria have adapted to grow in nodules of legumes such as peas and clover. These bacteria make nitrogen available to the plant and in turn, receive nutrients from the tissues of the plant. This type of interaction is known
   A) commensalism.
   B) hybridization.
   C) mutualism.
   D) parasitism.

13) In which state would you most likely find a biome that is known for its large herbivores, few trees, and fire-dependent ecology?
   A) Alaska
   B) Arizona
   C) California
   D) South Florida

14) When a muscle contracts, it performs work. It does this by
   A) converting chemical energy to mechanical energy.
   B) converting mechanical energy into heat energy.
   C) converting mass into energy.
   D) creating energy.
Lichens, represented by this symbiotic relationship, are responsible for __________ or the establishment of a new site for plant growth.

A) primary succession  
B) secondary succession  
C) trophic metamorphosis  
D) ecological infiltration  

16)

Crocodile Steve was killed doing what he loved best - hanging out in the water, observing the wildlife around him. One wildlife adaptation cost Steve his life.

Stingrays, catfish, and scorpion fish all have an adaptation that helps protect them against predators. This adaptation is

A) venom.  
B) mimicry.  
C) camouflage.  
D) electric organs.  

17) Which biome is characterized by low annual rainfall, less than 26 centimeters (about 10-11 inches) per year?

A) desert  
B) tundra  
C) grassland  
D) tropical rain forest
This is a typical grassland food web. It is also a small picture of an important cycle on Earth: the carbon cycle. Man can impact the carbon cycle in a negative way. All but one example below would negatively impact the carbon cycle. Identify it.

A) Planting a field of wheat
B) A factory with smoke stacks
C) The local landfill burning trash
D) Paved streets with many cars on the roads

19)
According to the dichotomous key, the amoeba seen in the illustration would belong in the kingdom
   A) Eubacteria.
   B) Fungi.
   C) Plantae.
   D) Protista.

20) Many plants have thorns on their stems or leaves. What is the MOST likely explanation for the evolution of thorns?
   A) Thorns help plants produce more food from photosynthesis.
   B) Thorns are an example of a mutation that arises in the genetic code of plants.
   C) Thorns help plants to conserve resources like water and soil nutrients that may be used by other organisms.
   D) Thorns are an adaptation that some plants have evolved in order to discourage herbivores from eating the plant.

21) In a prokaryotic cell, most ribosomes are
   A) in the nucleus.
   B) attached to the ER.
   C) attached to the nucleus.
   D) floating freely in the cytoplasm.
22) Venomous snakes such as the rattlesnake and copperhead have few natural predators. This is MAINLY due to their
   A) camouflage.
   B) habitat.
   C) mimicry.
   D) venom.

A wildlife biologist suggests re-introducing the eastern cougar into southern Alabama, reasoning that besides bears, which can survive off of berries and grubs, there are no large natural predators, and that it would be good for the food chain. It is assumed that the eastern cougar would eat deer, which in turn, graze on tree bark, shrubs, and leaves. The average cougar weighs about 100 pounds, as does the average deer. The average cougar has a range of one square mile. A recent biological study showed that there were about 16 deer per square mile in Alabama, an average about 40,000 pounds of vegetation per square mile, and an average of 9.5 people per square mile in southern Alabama. Despite the biologist’s proposal, other biologists vote against re-introducing the cougar.

Which of these is a possible VALID reason for this?
   A) The cougars would compete with bears for berries and grubs.
   B) There are not enough deer per square mile, to support the cougar.
   C) The biologists are worried that the cougar will be harmed or harm people in the cougar’s range.
   D) There is not enough vegetation to support the deer, if they are pressured by hunting from cougars.

24) The nucleus contains the cells genetic material in the form of
   A) ADP.
   B) ATP.
   C) DNA.
   D) RNA.

25) If you decide to buy a purebred puppy, you would have many different dog breeds to choose from. The wide variety of dog breeds is the result of hundreds of years of
   A) random mating.
B) gene sequencing.
C) selective breeding.
D) genetic engineering.

26) All living things have one element in common. It is recycled when organisms die and are recycled. It is transformed from one form to another through photosynthesis and cellular respiration. That element is
A) carbon.
B) hydrogen.
C) nitrogen.
D) oxygen.
The graph shows the results of a famous biological experiment. In the experiment, Kettlewell believed that the peppered moth demonstrated how environmental pressures influence evolution. He studied two areas. Birmingham was a rural wood, with natural conditions. Dorset was an urban, industrial area. The moths use tree trunks to camouflage themselves against birds, which are their major predators. Natural gene variations produce a light form of the peppered moth, and a dark form, meaning that they are not equally visible.

All BUT ONE statement is supported by Kettlewell’s data. That is
A) Dark moths had a survival disadvantage in industrial Dorset.
B) Light moths had a survival advantage in forested Birmingham.
C) Light moths had a survival disadvantage in industrial Dorset.
D) Dark moths had a survival disadvantage in forested Birmingham.

28) Which organism would MOST LIKELY be the main source of oxygen in a forest ecosystem?
A) ants
B) lichens
C) oak trees
D) mushrooms

29)
The early ancestors of the horse (shown in the picture) were adapted to life in tropical forests. Gradually the forests disappeared and were replaced with open grasslands. Because of the gradual change in habitat, modern horses

A) have five toes that allow them to walk well on soft ground.
B) are herbivores instead of carnivores like their early ancestors.
C) are taller with long legs and are capable of great speed to escape predators.
D) have gradually grown larger, but show no major changes from the early ancestors.

30) According to the law of conservation of matter, matter is never created or destroyed. Yet in a food pyramid the amount of biomass decreases as we move up through the pyramid, from producers to top level consumers. Why?

A) Matter is decomposed at different levels in a food chain.
B) Matter is recycled at each level of the food chain and returned back to the producers.
C) Matter is taken back by the producers after it is left unused by consumers at each level.
D) Matter changes to other forms that might not continue to be a part of the same food chain.

31) Which BEST illustrates a relationship between a producer and a consumer.

A) a zebra eating grass
B) a snake eating a rodent
C) a bird eating an insect
D) a barnacle attached to a whale

32) The MAIN difference between a rain forest and a desert is the

A) number of seasons.
B) number of decomposers.
C) amount of land occupied.
D) amount of precipitation.
33) Which of these correctly describes sexual reproduction?
   A) It produces only a single offspring at a time.
   B) It needs two parents to form a daughter cell.
   C) It needs a single parent to form a daughter cell.
   D) It produces offspring that look exactly similar.

34) The population of mice in a local forest ecosystem has recently died out due to disease. In the past, these mice made up a large part of the diet of the forest fox.

   What is the best prediction about what will happen to the foxes?
   A) The drop in the mouse population will lead to a drop in the fox population.
   B) The drop in the mouse population will lead to no change in the fox population.
   C) The drop in the mouse population will lead to an increase in the fox population.
   D) The increase in the mouse population will lead to an increase in the fox population.

35)

   Types of Epithelium

   Simple squamous
   Simple cuboidal
   Simple columnar
   Transitional
   Stratified squamous
   Stratified cuboidal
   Pseudostratified columnar

   Your skin is the largest organ of your body. The skin and its appendages, hair and nails, are known as the integumentary system. All BUT one of these are functions of your skin.
   A) aids in the production of vitamin D
   B) helps regulate your body temperature
   C) first line of protection against invaders
   D) semipermeable membrane to substances like glucose

36) Which trait is an adaptation that a temperate grassland animal might possess?
   A) gripping tail
   B) complete absence of fur
   C) large fat storage reserves
   D) gut with four stomach chambers

37) Which of these lurks on tall plants and weeds waiting for a host to pass by?
   A) heartworm
   B) mosquito
   C) tapeworm
   D) tick
38) An amoeba "eats" or engulfs a large amount of food through the process of
A) exocytosis.
B) endocytosis.
C) passive transport.
D) facilitated diffusion.

39) Which microscope would be MOST useful for quickly estimating the number of red blood cells in a patient's blood sample?
A) compound light microscope
B) binocular stereomicroscope
C) scanning electron microscope
D) transmission electron microscope
40) To ensure its survival, any species must be able to
   A) kill competitors.
   B) reproduce successfully.
   C) obtain enough energy through food.
   D) maintain internal body homeostasis.

41) Eddie's assignment is to prepare a dichotomous key for several objects. His first task was to arrange the objects. The objects are a lightning bug, a butterfly, a ladybug, and a canary. While organizing the objects, Eddie considered several options and found that the most general categories should be listed first.

Which criteria should Eddie use first to divide the organisms into two groups?
   A) is living or is not living
   B) has legs or does not have legs
   C) has wings or does not have wings
   D) has feathers or does not have feathers

42) The albino cavefish lives deep inside of caves where very little light ever reaches. This species is blind, and its skin actually has grown over where its eyes should be.

Knowing that they developed from ancestors that could see, which of these would best help explain why the albino cavefish is now blind?
   A) Botany
   B) Evolution
   C) Microbiology
   D) Mycology

43) Sara was preparing for a biology lab that included using the light microscope. First Sara washed her hands. Then she picked up the microscope and carried it, holding the base, to her lab bench. She removed the cover and cleaned the lenses using lens paper. Finally, she plugged in the microscope light. Sara’s teacher commented that Sara made one mistake when setting up her microscope. What was it?
   A) Students should not plug in electrical apparatus.
   B) Washing her hands might contaminate the microscope.
   C) Sara did not carry the microscope correctly, one hand on arm and one on base.
   D) Sara should have removed the cover before carrying the microscope to the lab bench.
The factors listed have an immediate effect on the animal populations found in any habitat. The four factors would lead to:

A) death.
B) emigration.
C) immigration.
D) mutations.
Scientists use a *dichotomous key* to help them identify and classify living things. The word *dichotomous* means

A) most to least.
B) general to specific.
C) divided into two parts.
D) divided into specifics.