MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) Each of the following statements is a basic principle of the cell doctrine EXCEPT which one of the following?
   A) A single cell is the smallest unit that exhibits all of the characteristics of life.
   B) All cells have a nucleus and organelles.
   C) All cells come from preexisting cells.
   D) All living things are composed of cells and cell products.

2) Most eukaryotic cells have a membrane-bound _____ that contains the genetic material.
   A) lysosome
   B) cell wall
   C) nucleus
   D) plasma membrane
   E) cytoplasm

3) To increase the surface area of some cells, the plasma membrane possesses
   A) flagella.
   B) transport proteins.
   C) receptors.
   D) microvilli.

4) There are different types of microscopes that can be used to provide information about cells. Which type of microscope is used for the observation of living cells?
   A) transmission electron microscope
   B) scanning electron microscope
   C) light microscope

5) The products of the endoplasmic reticulum are transported to the Golgi apparatus by
   A) free-floating ribosomes.
   B) cilia.
   C) gated channels.
   D) vesicles.
   E) endocytosis

6) Which one of the following organelles is involved in the production of proteins ?
   A) smooth endoplasmic reticulum
   B) lysosome
   C) mitochondrion
   D) rough endoplasmic reticulum
   E) centriole

7) Which organelle is responsible for removal of other damaged organelles and cellular debris?
A) smooth endoplasmic reticulum
B) mitochondria
C) centrioles
D) ribosomes
E) lysosomes

8) Muscle cells store energy in the form of _____ until it is used for the production of ATP.
A) glucose B) sucrose C) starch D) glycerol E) glycogen

9) Which one of the following statements CORRECTLY describes the architecture of a plasma membrane?
A) Phospholipids line the internal cytoplasmic surface, and proteins cover the external surface, sandwiching cholesterol in the middle.
B) Proteins and cholesterol are embedded in the phospholipid bilayer, forming a fluid mosaic.
C) Proteins line the internal, cytoplasmic surface, and phospholipids cover the external surface.
D) Proteins, phospholipids, and cholesterol are joined by strong covalent bonds that give the membrane strength.

10) Which plasma membrane component provides mechanical strength and maintains the correct amount for rigidity and flexibility?
A) protein
B) carbohydrates
C) phospholipids
D) triglycerides
E) cholesterol

11) Bulk movement of water across plasma membranes and the exchange of oxygen from blood into cells are similar in that the method of transport is by
A) active transport.
B) sodium-potassium pumps.
C) endocytosis.
D) facilitated transport.
E) diffusion.

12) Gated channels are especially important in regulating the transport of _____ across a plasma membrane.
A) glucose
B) small uncharged molecules
C) nucleic acids
D) ions
E) water

13) Which one of the following is TRUE regarding active transport?

A) Molecules are moved across a plasma membrane from an area of higher concentration to an area of lower concentration.

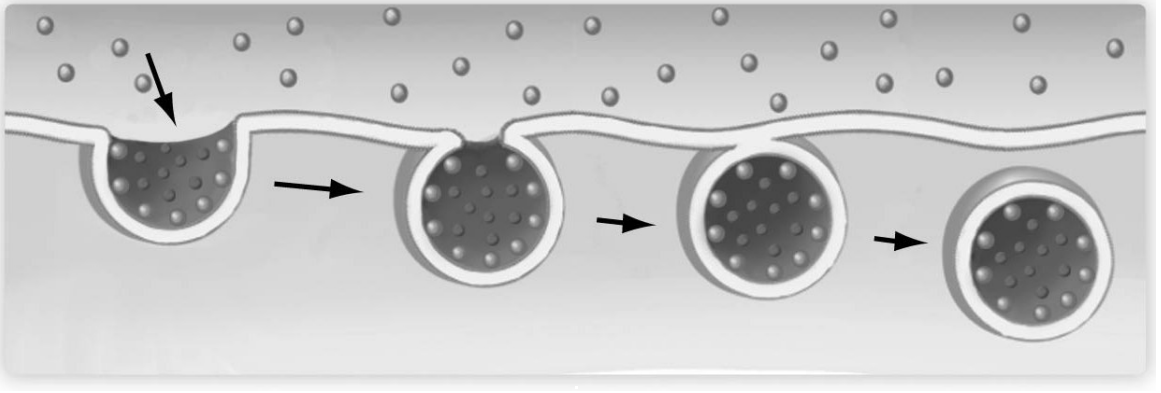
B) Active transport requires the input of energy.

C) Molecules to be transported attach to phospholipids in the plasma membrane; as the phospholipids change shape, the molecules are moved across the membrane.

D) This mechanism allows a cell to equalize the concentration of molecules on either side of the plasma membrane.

E) Active transport relies on the process of diffusion.

14)



The accompanying figure shows a portion of the cell membrane. Which one of the following processes does it depict?

A) facilitated diffusion

B) diffusion

C) exocytosis

D) endocytosis

E) gated channels

15) Chemical reactions that result in the synthesis or assembly of large molecules are referred to as

A) anabolic. B) catabolic. C) anaerobic. D) aerobic. E) glycolysis.

16) Which one of the following is TRUE regarding cellular respiration?

A) requires the presence of oxygen

B) results in the synthesis of large sugar molecules

C) begins with the electron transport system

D) produces carbon dioxide and oxygen

E) results in the complete breakdown of ATP

17) Which one of the following stages in the catabolism of glucose involves the splitting of glucose into two three-carbon molecules?
A) glycolysis
B) movement of electrons through the electron transport system
C) the citric acid cycle
D) conversion of pyruvate to acetyl CoA
E) movement of NADH to the electron transport system

18) Which one of the following is first used by cells as an energy source?
A) lactic acid B) glucose C) fat D) amino acids E) glycogen

19) The burning sensation associated with muscle fatigue is due to the accumulation of
A) pyruvate.
B) NADH.
C) lactic acid.
D) carbon dioxide.
E) protein.

20) A group of cells that are similar in structure and work together to perform a common function are referred to as a(n)
A) organ system.
B) tissue.
C) organism.
D) community.
E) organ.

21) Tissue lining a surface is classified as
A) muscle.
B) connective.
C) nervous.
D) epithelial.
E) connective and nervous.

22) Which one of the following is found directly beneath the cells of an epithelial tissue?
A) bi or multipolar extensions
B) muscle tissue
C) basement membrane
D) fibrous connective tissue
E) collagen and elastic fibers

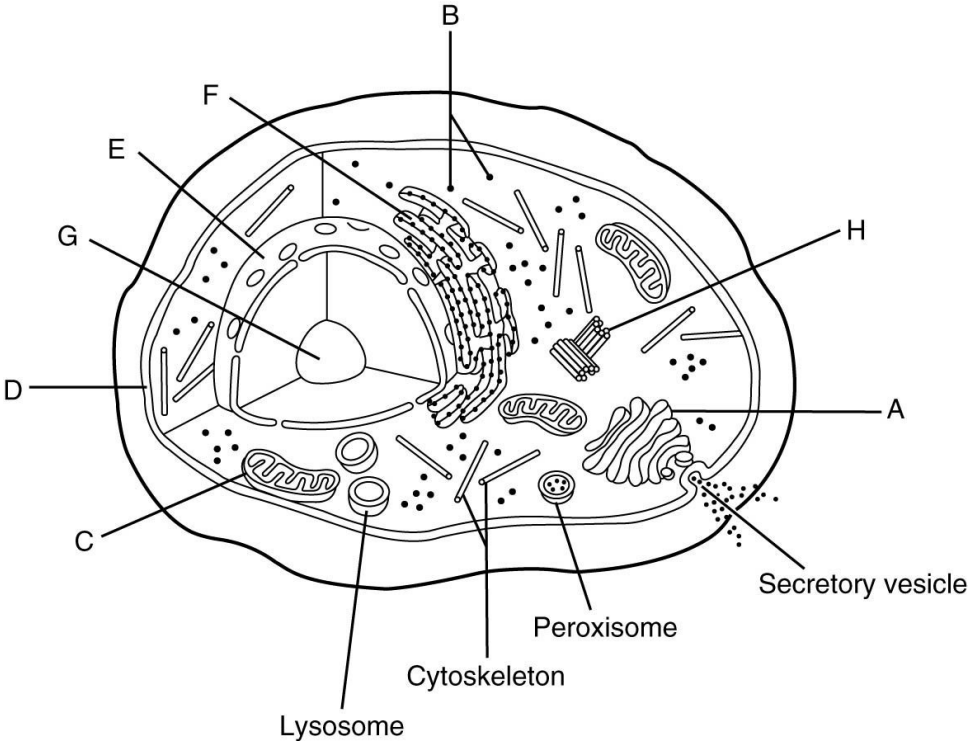
23) Which one of the following is(are) present to ensure adjacent cells are packed close together?

A) adhesion junctions
B) basement membrane
C) gap junctions
D) tight junctions
E) collagen

24) Which one of the following are composed of flattened cells arranged in a single layer ?

A) simple cuboidal
B) stratified cuboidal
C) simple columnar
D) simple squamous
E) stratified squamous

MATCHING. Choose the item in column 2 that best matches each item in column 1.



Using the accompanying figure, identify the organelles of a eukaryotic cell.

25) Label B represents a(n) _____.

26) Label D represents a(n) _____.

27) Label C represents a(n) _____.

A) plasma membrane
B) ribosome
C) mitochondrion

28) Label E represents a(n) _____.

29) Label F represents a(n) _____.

30) Label A represents a(n) _____.

A) endoplasmic reticulum

B) nucleus

C) Golgi apparatus

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

31) All of the following are types of connective tissue EXCEPT which one?

A) cartilage B) bone C) muscle D) adipose E) blood

32) In which one of the following locations would one expect to find cartilage?

A) in adipose tissue
B) between the skin and the underlying muscle
C) in the wall of a blood vessel
D) in a tendon
E) between the vertebrae

33) Which type of tissue is characteristic of ligaments and tendons?

A) loose connective tissue
B) dense connective tissue
C) muscle tissue
D) elastic connective tissue
E) reticular connective tissue

34) What general type of tissue is characterized by few cells, separated by a nonliving extracellular matrix?

A) connective tissue
B) nervous tissue
C) epithelial tissue
D) muscle tissue
E) organ tissue

35) The type of muscle responsible for involuntary contractions of the stomach is _____ muscle.

A) striated B) intercalated C) skeletal D) smooth E) cardiac

36) Which type of tissue is able to contract?

A) dense connective
B) loose connective
C) nervous
D) epithelial
E) muscle

37) Which one of the following tissues can respond to the environment by generating electrical signals?
A) muscle B) connective C) nervous D) dermis E) epithelial

38) Which one of the following are structures in the body that are composed of two or more different tissue types joined together to perform a specific function?
A) junctions
B) body cavities
C) tissues
D) organ systems
E) organs

39) Which one of the following statements is TRUE regarding glial cells?
A) They produce blood plasma.
B) They are located in the matrix of cartilage.
C) They transmit nerve impulses from the brain to the internal organs.
D) They stimulate the contraction of cardiac muscle.
E) They support and protect neurons.

40) Which one of the following membranes lines the airways and digestive tract?
A) synovial
B) cutaneous
C) membranous
D) serous
E) mucous

41) Which one of the following is a tissue membrane positioned in thin cavities between bones in movable joints?
A) serous membrane
B) synovial membrane
C) basement membrane
D) mucous membrane
E) cutaneous membrane

42) In a negative feedback system, which one of the following statements is TRUE?
A) Homeostasis cannot be re-established until the effector is turned off.
B) A sensor detects a stimulus, which in turn amplifies the original disturbance.
C) The effector activates the sensor.
D) A sensor is not needed because the body anticipates the coming change.
E) Deviations from a desired condition are automatically detected and counteracted.

43) Positive feedback control occurs
A) during maintenance of proper body temperature.
B) when insulin and glucagon regulate blood glucose levels.
C) to counter the effects of negative feedback.
D) in other animals but not in humans.
E) during the process of childbirth (labor).

44) Each of these organ systems is involved in the homeostatic regulation of body temperature EXCEPT which one?
A) nervous system
B) integumentary system
C) muscular system
D) skeletal system
E) circulatory system

45) Weight loss typically leads to a reduction in both the number and size of adipocytes.
A) True
B) False

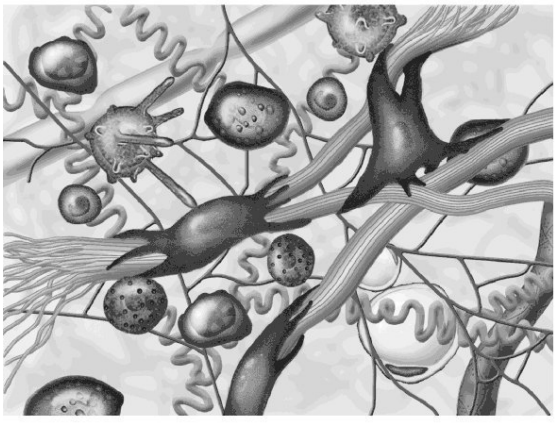
46) Tanning increases the number and density of melanocytes in the epidermis.
A) True
B) False

47) Sweat is released by exocrine glands on the skin surface as a means to lower body temperature.
A) True
B) False

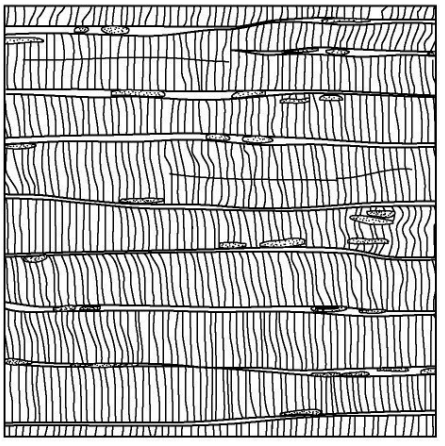
48) Cartilage functions well as a cushioning structure because it is composed primarily of collagen fibers in a ground substance with a lot of water.
A) True
B) False

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

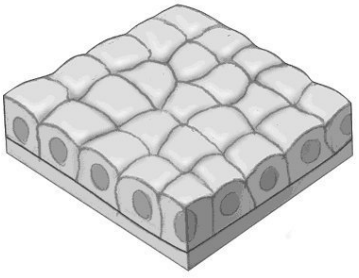
Match each of the following diagrams in the figure below to the type of tissue it represents.



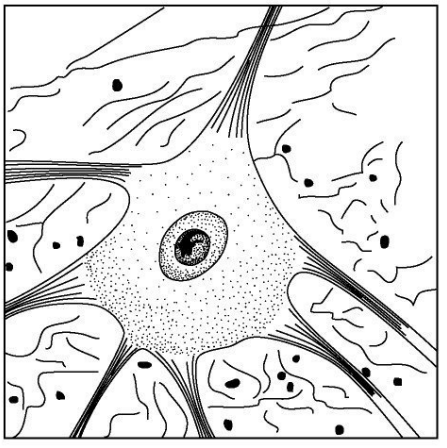
A



B



C



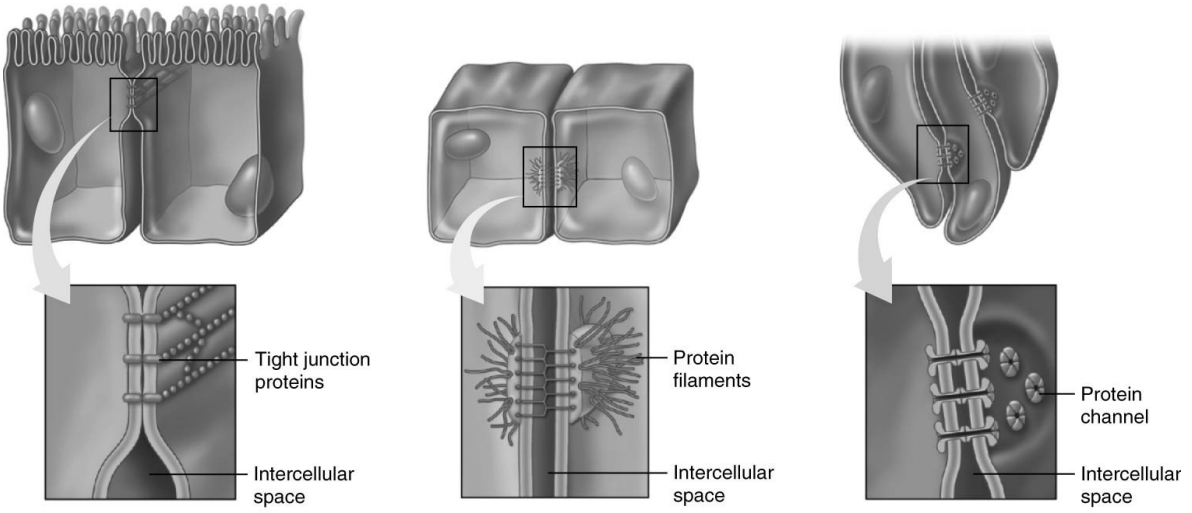
D

49) connective

50) muscle

51) designed for secretion and absorption

52) nervous



Tight junctions form leak-proof seals between cells.

Adhesion junctions anchor two cells together, yet allow flexibility of movement.

Gap junctions provide for the direct transfer of water and ions between adjacent cells.

Using the figure above, identify the type of cell junction used in each of the following.

53) These junctions join cardiac cells, allowing transfer of ions and water between cells.

54) These junctions allow for movement and flexibility, such as is needed for tissues like the epithelium of the skin that must stretch and bend.

55) These junctions are found between cells lining the digestive tract and prevent the passage of any substances between adjoining cells.

1) B
2) C
3) D
4) C
5) D
6) D
7) E
8) E
9) B
10) E
11) E
12) D
13) B
14) D
15) A
16) A
17) A
18) B
19) C
20) B
21) D
22) C
23) D
24) D
25) B
26) A
27) C
28) B
29) A
30) C
31) C
32) E
33) B
34) A
35) D
36) E
37) C
38) E
39) E
40) E
41) B
42) E

43) E
44) D
45) B
46) B
47) A
48) A
49) A
50) B
51) C
52) D
53) C
54) B
55) A