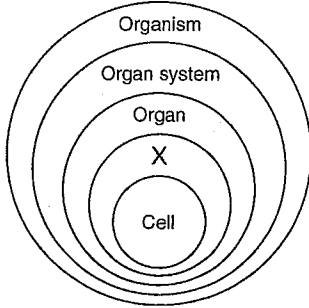


Levels of Organization and Cell Organelles
Review Packet 1

1. The diagram below represents levels of organization in living things.



Which term would best represent X?

- 1) human
- 2) tissue
- 3) stomach
- 4) organelle

2. Which sequence of terms is in the correct order from simplest to most complex?

- 1) cells → tissues → organs → organ systems
- 2) tissues → organisms → cells → organ systems
- 3) cells → tissues → organ systems → organs
- 4) organs → organisms → organ systems → cells

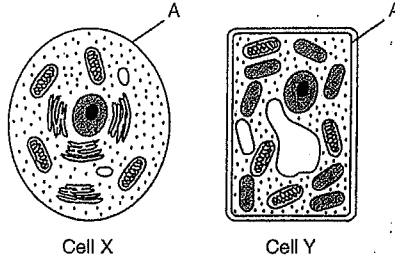
3. The phrase "is not a cell but has the ability to reproduce within a living cell" can be used to describe

- 1) an alga
- 2) a yeast
- 3) a bacterium
- 4) a virus

4. An organelle that releases energy for metabolic activity in a nerve cell is the

- 1) chloroplast
- 2) ribosome
- 3) mitochondrion
- 4) vacuole

5. The diagram below represents two cells, X and Y.



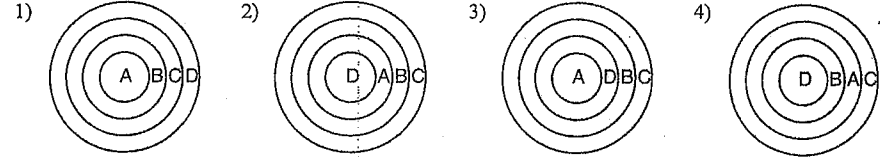
Which statement is correct concerning the structure labeled A?

- 1) It aids in the removal of metabolic wastes in both cell X and cell Y.
- 2) It is involved in cell communication in cell X, but not in cell Y.
- 3) It prevents the absorption of CO₂ in cell X and O₂ in cell Y.
- 4) It represents the cell wall in cell X and the cell membrane in cell Y.

Levels of Organization and Cell Organelles

6. Which diagram best represents the relative locations of the structures in the list below?

- A—chromosome
- B—nucleus
- C—cell
- D—gene



7. Certain poisons are toxic to organisms because they interfere with the function of enzymes in mitochondria. This results directly in the inability of the cell to

- 1) store information
- 2) build proteins
- 3) release energy from nutrients
- 4) dispose of metabolic wastes

8. As a human red blood cell matures, it loses its nucleus. As a result of this loss, a mature red blood cell lacks the ability to

- 1) take in material from the blood
- 2) release hormones to the blood
- 3) pass through artery walls
- 4) carry out cell division

9. Homeostasis in unicellular organisms depends on the proper functioning of

- 1) organelles
- 2) insulin
- 3) guard cells
- 4) antibodies

10. Which organelle is correctly paired with its specific function?

- 1) cell membrane—storage of hereditary information
- 2) chloroplast—transport of materials
- 3) ribosome—synthesis of proteins
- 4) vacuole—production of ATP

11. Hereditary information is stored inside the

- 1) ribosomes, which have chromosomes that contain many genes
- 2) ribosomes, which have genes that contain many chromosomes
- 3) nucleus, which has chromosomes that contain many genes
- 4) nucleus, which has genes that contain many chromosomes

12. The largest amount of DNA in a plant cell is contained in

- 1) a nucleus
- 2) a chromosome
- 3) a protein molecule
- 4) an enzyme molecule

13. Most of the hereditary information that determines the traits of an organism is located in

- 1) only those cells of an individual produced by meiosis
- 2) the nuclei of body cells of an individual
- 3) certain genes in the vacuoles of body cells
- 4) the numerous ribosomes in certain cells

38.

Organelle	Process Involving Chemical Reactions that Occur in the Organelle	How the Process is Important to the Functioning of the Organism
mitochondrion	respiration	provides energy for life functions
chloroplast	photosynthesis	provides food for plant
ribosome	protein synthesis	makes structural molecules (or chemical messengers which control cell responses)
nucleus	mitosis or meiosis or DNA replication	reproduction

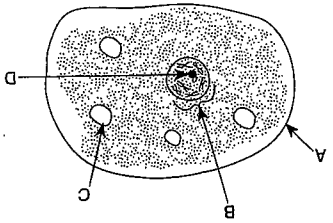
Key
cont. →

39. Examples: — photosynthesis — production of cellulose — produces chlorophyll — producing its own food

21. 2 _____ 1. 2 _____
22. 4 _____ 2. 1 _____
23. accept "b" 3. 4 _____
24. 2 _____ 4. 3 _____
25. 1 _____ 5. 1 _____
26. 2 _____ 6. 2 _____
27. 3 _____ 7. 3 _____
28. 2 _____ 8. 4 _____
29. 2 _____ 9. 1 _____
30. 4 _____ 10. 3 _____
31. 1 _____ 11. 3 _____
32. 1 _____ 12. 1 _____
33. 3 _____ 13. 2 _____
34. organelle 14. 4 _____
- cell 15. 4 _____
- tissue 16. 2 _____
- organ 17. 3 _____
- organism 18. 2 _____
35. 3 _____ 19. 4 _____
36. ribosome 20. 4 _____
37. chloroplast

Levels of Organization and Cell Organelles

24. A cell is represented in the diagram shown below.



Which statement about the cell is correct?

- 1) Structure A synthesizes and secretes cellular products.
- 2) Structure B contains nucleotides involved in transmitting genetic information.
- 3) Structure C utilizes carbon dioxide in the process of photosynthesis.
- 4) Structure D is the site of aerobic respiration.

25. Transport of molecules within animal cells is assisted by a system of internal membranes that make up the

- 1) endoplasmic reticulum
- 2) mitochondria
- 3) ribosomes
- 4) chloroplast

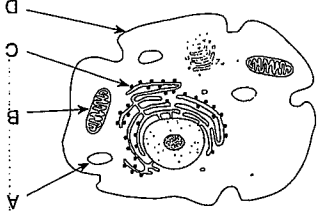
26. Which organelle is correctly paired with its function?

- 1) nucleus — provides carbohydrates for fermentation
- 2) chloroplast — serves as a site for photosynthesis
- 3) centriole — synthesizes digestive enzymes
- 4) lysosome — packages cellular products

21. One difference between plant and animal cells is that animal cells do *not* have

- 1) a nucleus
- 2) chloroplasts
- 3) a cell membrane
- 4) centrioles

22. Which letter in the diagram below indicates the structure that is most closely associated with excretion?



- 1) A
- 2) B
- 3) C
- 4) D

23. A structure that performs a specialized function within a cell is known as

- 1) a tissue
- 2) an organelle
- 3) an organ
- 4) a system

Key (cont.) ↑

41. Examples: A — cell/plasma membrane or B — nucleus or C — mitochondrion.

42. — Structure 3 provides the energy needed for protein synthesis.

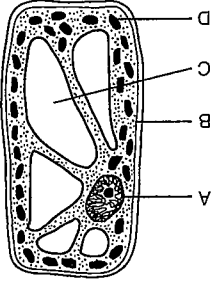
43. — Structure 2 provides the code for assembling a protein at structure 1.

Levels of Organization and Cell Organelles

17. Studies of fat cells and thyroid cells show that fat cells have fewer mitochondria than thyroid cells. A biologist would most likely infer that fat tissue

- 1) does not require energy
- 2) has energy requirements equal to those of thyroid tissue
- 3) requires less energy than thyroid tissue
- 4) requires more energy than thyroid tissue

18. Which letter indicates a cell structure that directly controls the movement of molecules into and out of the cell?



- 1) A
- 2) B
- 3) C
- 4) D

19. In a cell, all organelles work together to carry out

- 1) diffusion
- 2) active transport
- 3) information storage
- 4) metabolic processes

20. Which cell organelle is most directly involved with the bonding of amino acids?

- 1) mitochondrion
- 2) endoplasmic reticulum
- 3) cell wall
- 4) ribosome

40. Examples: — A (cell membrane) regulates what enters and leaves the cell. — B (nucleus) controls cell activities or contains the genetic codes. (Do not "praise" or "control center" without further explanation.) — C (mitochondrion) respiration or energy release or production of ATP (Do not accept "power house" without further explanation.)

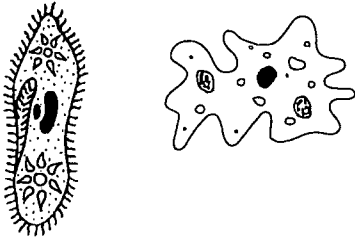
14. Muscle cells in athletes often have more mitochondria than muscle cells in nonathletes. Based on this observation, it can be inferred that the muscle cells in athletes

- 1) have a smaller demand for cell proteins than the muscle cells of nonathletes
- 2) reproduce less frequently than the muscle cells of nonathletes
- 3) have nuclei containing more DNA than nuclei in the muscle cells of nonathletes
- 4) have a greater demand for energy than the muscle cells of nonathletes

15. In a cell, information that controls the production of proteins must pass from the nucleus to the

- 1) cell membrane
- 2) chloroplasts
- 3) mitochondria
- 4) ribosomes

16. The diagram below represents two single-celled organisms.



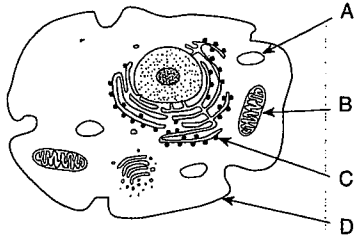
These organisms carry out the activities needed to maintain homeostasis by using specialized internal

- 1) tissues
- 2) organelles
- 3) systems
- 4) organs

Key (cont.)

Levels of Organization and Cell Organelles

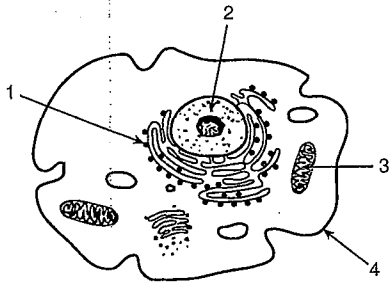
27. Which letter in the diagram below indicates an organelle that functions primarily in the synthesis of long chains of amino acids?



- 1) A 3) C
2) B 4) D

28. After a cell was treated with a certain chemical, the ribosomes stopped functioning. Which cell activity was immediately affected by this change in ribosome function?

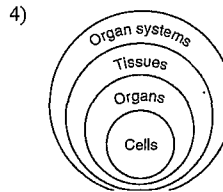
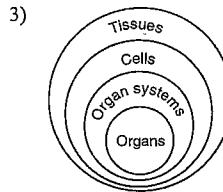
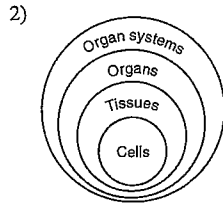
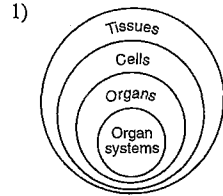
- 1) intracellular transport
2) protein synthesis
3) aerobic respiration
4) excretion of metabolic wastes



42. Choose either structure 3 or structure 4, write the number of the structure on the line below, and describe how it aids the process of protein synthesis. Structure: _____

43. Describe how structures 1 and 2 interact in the process of protein synthesis.

29. Which diagram best represents the levels of organization in the human body?



30. The levels of organization for structure and function in the human body from least complex to most complex are

- 1) systems → organs → tissues → cells
2) cells → organs → tissues → systems
3) tissues → systems → cells → organs
4) cells → tissues → organs → systems

Levels of Organization and Cell Organelles

31. Which sequence illustrates the increasing complexity of levels of organization in multicellular organisms?

- 1) organelle → cell → tissue → organ → organ system → organism
2) cell → organelle → tissue → organ → organ system → organism
3) organelle → tissue → cell → organ → organ system → organism
4) cell → organism → organ system → organ → tissue → organelle

32. Some human body cells are shown in the diagrams below.



Cells from skin



Blood cells



Cells from lining of bladder



Cells from lining of trachea

- These groups of cells represent different

- 1) tissues in which similar cells function together
2) organs that help to carry out a specific life activity
3) systems that are responsible for a specific life activity
4) organelles that carry out different functions

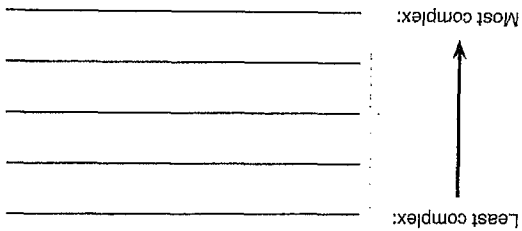
33. Which sequence represents the correct order of levels of organization found in a complex organism?

- 1) cells → organelles → organs → organ systems → tissues
2) tissues → organs → organ systems → organelles → cells
3) organelles → cells → tissues → organs → organ systems
4) organs → organ systems → cells → tissues → organelles

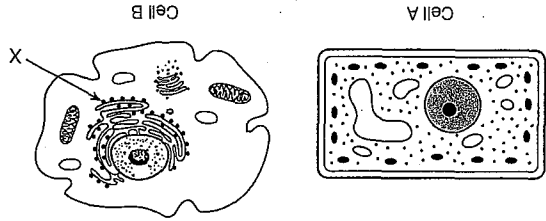
Levels of Organization and Cell Organelles

Write the structures listed below in order from least complex to most complex.

- organ
- cell
- organism
- organelle
- tissue



Base your answers to questions 35 through 37 on the information below and on your knowledge of biology. The diagrams represent two different cells and some of their parts. The diagrams are not drawn to scale.



35. Which statement best describes these cells?
- 1) Cell B lacks vacuoles while cell A has them.
 - 2) DNA would not be found in either cell A or cell B.
 - 3) Both cell A and cell B use energy released from ATP.
 - 4) Both cell A and cell B produce antibiotics.

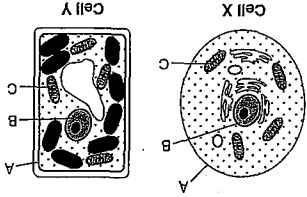
36. Identify the organelle labeled X in cell B.
37. Identify an organelle in cell A that is the site of autotrophic nutrition.

Levels of Organization and Cell Organelles

38. Organelles carry out specific processes involving chemical reactions. In the chart below, identify two organelles and, for each, identify a process involving chemical reactions that occurs there. Describe one specific way each process identified is important to the functioning of the organism.

Organelle	Process Involving Chemical Reactions that Occur in the Organelle	How the Process is Important to the Functioning of the Organism
(1)		
(2)		

Base your answers to questions 39 through 41 on the diagrams below of two cells, X and Y, and on your knowledge of biology.



39. Identify one process that is carried out in cell Y that is *not* carried out in cell X.
40. State one function of the organelle that you identified in the previous question.
41. Select one lettered organelle and write the letter of that organelle in the space below. Identify the organelle you selected.