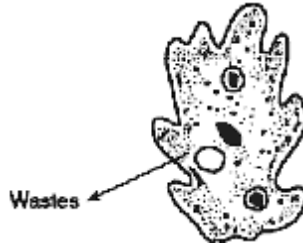


NOW LET'S TRY SOME HOMEWORK QUESTIONS

To assign fewer questions, you may want to skip the questions with underlined numbers.

1. Energy from organic molecules can be stored in ATP molecules as a direct result of the process of

| | |
|---------------------------|---------------|
| (1) cellular respiration | (3) diffusion |
| (2) cellular reproduction | (4) digestion |
2. A single-celled organism is represented in the diagram below. An activity is indicated by the arrow.



If this activity requires the use of energy, which substance would be the source of this energy?

- | | |
|---------------|-----------------|
| (1) DNA | (2) ATP |
| (3) a hormone | (4) an antibody |
3. To remain healthy, organisms must be able to obtain materials, change the materials, move the materials around, and get rid of waste. These activities directly require

| | |
|--------------------------------------|-----------------------------------|
| (1) energy from ATP | (2) the replication of DNA |
| (3) nutrients from inorganic sources | (4) manipulation of altered genes |
 4. Living organisms must be able to obtain materials, change the materials into new forms, remove poisons, and move needed material from one place to another. Many of these activities directly require

| | |
|------------------------------|--|
| (1) energy released from ATP | (2) carbohydrates formed from receptor molecules |
| (3) the synthesis of DNA | (4) the breakdown of energy-rich inorganic molecules |
 5. Which structure is best observed using a compound light microscope?

| | |
|-------------|--|
| (1) a cell | (3) a DNA sequence |
| (2) a virus | (4) the inner surface of a mitochondrion |
 6. In a cell, all organelles work together to carry out

| | |
|----------------------|-------------------------|
| (1) diffusion | (3) information storage |
| (2) active transport | (4) metabolic processes |
 7. Write the structures listed below in order from least complex to most complex.

organ
cell
organism
organelle
tissue

| | | |
|----------------|-------|-------|
| Least complex: | _____ | _____ |
| ↓ | | |
| Most complex: | _____ | _____ |

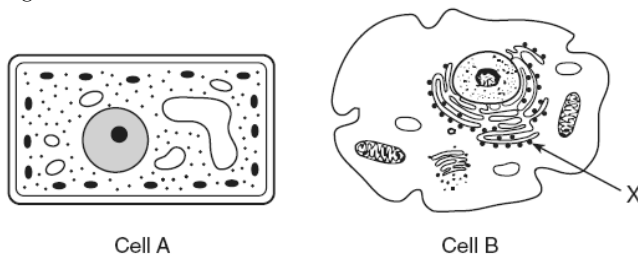
8. The respiratory system includes a layer of cells in the air passages that clean the air before it gets to the lungs. This layer of cells is best classified as

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

9. Which structure is best observed using a compound light microscope?

- (1) a cell (3) a DNA sequence
 (2) a virus (4) the inner surface of a mitochondrion

Base your answers to the next three questions on the diagrams 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.



10. Identify an organelle in cell *A* that is the site of autotrophic nutrition.

11. Identify the organelle labeled *X* in cell *B*.

12. 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.

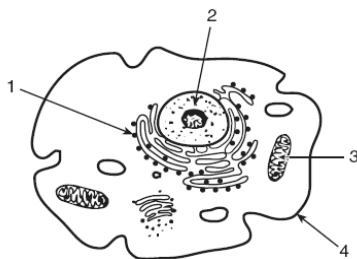
13. Which organelle is correctly paired with its specific function?

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

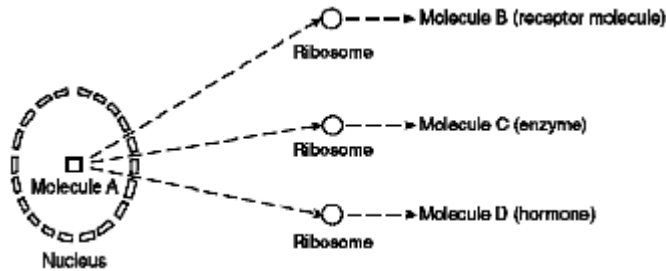
14. Just like complex organisms, cells are able to survive by coordinating various activities. Complex organisms have a variety of systems, and cells have a variety of organelles that work together for survival. Describe the roles of two organelles. In your answer be sure to include:

- the names of two organelles and the function of each
- an explanation of how these two organelles work together
- the name of an organelle and the name of a system in the human body that have similar functions

Base your answers to the following two questions on the diagram of a cell below.



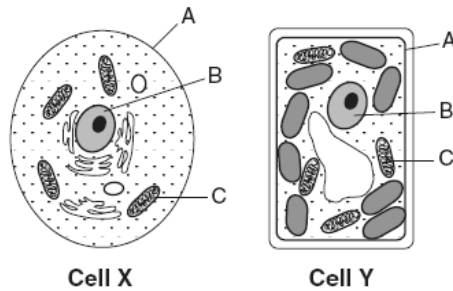
15. Choose either structure 3 or structure 4, write the number of the structure on the line provided, and describe how it aids the process of protein synthesis.
16. The diagram below represents a sequence of events in a biological process that occurs within human cells.



Molecule A contains the

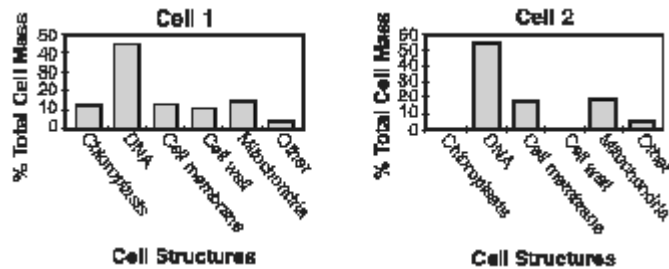
- (1) starch necessary for ribosome synthesis in the cytoplasm
- (2) organic substance that is broken down into molecules B, C, and D
- (3) proteins that form the ribosome in the cytoplasm
- (4) directions for the synthesis of molecules B, C, and D

Base your answers to the next three questions on the diagrams below of two cells, X and Y, and on your knowledge of biology.



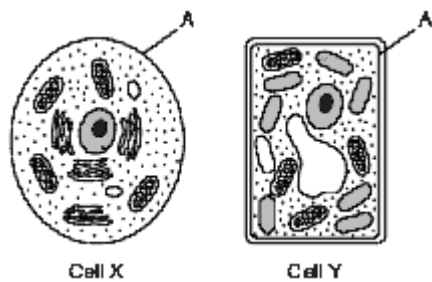
17. Select *one* lettered organelle and write the letter of that organelle in the space provided. Identify the organelle you selected.
18. State *one* function of the organelle that you identified in question 17, above.
19. Identify *one* process that is carried out in cell Y that is not carried out in cell X.
20. In a cell, information that controls the production of proteins must pass from the nucleus to the
- | | |
|-------------------|------------------|
| (1) cell membrane | (3) mitochondria |
| (2) chloroplasts | (4) ribosomes |

21. Data from two different cells are shown in the graphs below.



Which cell is most likely a plant cell? Support your answer.

22. 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.
23. Damage to which structure will most directly disrupt water balance within a single-celled organism?
- (1) ribosome
 - (2) cell membrane
 - (3) nucleus
 - (4) chloroplast
24. In the *Diffusion Through a Membrane* lab, the model cell membranes allowed certain substances to pass through based on which characteristic of the diffusing substance?
- (1) size
 - (2) shape
 - (3) color
 - (4) temperature
25. Molecule X moves across a cell membrane by diffusion. Which row in the chart below best indicates the relationship between the relative concentrations of molecule X and the use of ATP for diffusion?

| Row | Movement of Molecule X | Use of ATP |
|-----|--|------------|
| (1) | high concentration → low concentration | used |
| (2) | high concentration → low concentration | not used |
| (3) | low concentration → high concentration | used |
| (4) | low concentration → high concentration | not used |