

Read for Clarity: Schraer and Stoltze Ch. 5 Pages 90-97, Ch. 9 Pages 173-177 and
Ch. 19 Pages 375-380

Part I. General Transport. Match the following with the correct letter:

- | | |
|----------------------------------|---|
| (1)absorption _____ | (a)cells that pump sodium ions out to maintain an electrical potential |
| (2) carrier proteins _____ | (b)movement of materials across a cell membrane |
| (3) aortic arches _____ | (c)an extension of a root epidermal cell |
| (4) semi-permeable _____ | (d)a solution that has a low concentration of dissolved substances |
| (5) active transport _____ | (e)diffusion of water across a differentially permeable membrane |
| (6) nerve cells _____ | (f)whip-like structures that aid in water circulation in the hydra |
| (7) capillary action _____ | (g)an organelle that pumps excess water out of protists using active transport |
| (8) hypertonic solution _____ | (h)the rising of a column of water by evaporation at the leaves |
| (9) xylem _____ | (i)movement of materials into or out of a cell using cell energy |
| (10)flagella _____ | (j)the red pigment in earthworm blood that carries oxygen |
| (11)open circulation _____ | (k)the difference in concentration between a region of greater and a region of lesser concentration |
| (12)root hair _____ | (l)the upward movement of water due to cohesive forces in a narrow tube |
| (13)dorsal vessel _____ | (m)the extracellular transport system characteristic of insects |
| (14)contractile vacuole _____ | (n)the force within plant cells resulting from osmotic flow of water |
| (15)hemoglobin _____ | (o)the streaming of the cytoplasm |
| (16)intracellular circ. _____ | (p)proteins through which materials can be moved using active transport |
| (17)hypotonic solution _____ | (q)the vascular tissue carrying water up to the leaves |
| (18)turgor pressure _____ | (r)channels in the cytoplasm for transport |
| (19)capillaries _____ | (s)the equivalent of the vena cava in the earthworm |
| (20)cyclosis _____ | (t)allowing some materials through the cell membrane and restricting others |
| (21)endoplasmic reticulum _____ | (u)the vessels where exchange of materials with cells takes place |
| (22)phagocytosis _____ | (v)active transport involving pseudopodia |
| (23)concentration gradient _____ | (w)the only type of circulation required by unicellular organisms |
| (24)osmosis _____ | (x)a solution that will cause an animal cell to shrink |
| (25)transpiration pull _____ | (y)the heart-like structures in an earthworm |

Answers

MULTIPLE-CHOICE QUESTIONS

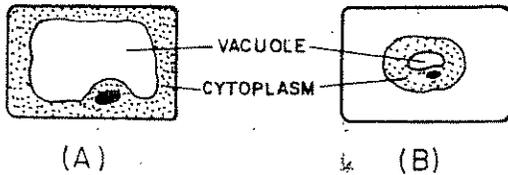
Gen. Transport

Section: _____

- _____ 1. A molecule that *cannot* pass through a cell membrane is (1) water.
(2) alcohol (3) glucose (4) starch
- _____ 2. The diffusion of water molecules into and out of cells is called (1)
cyclosis (2) pinocytosis (3) osmosis (4) homeostasis
- _____ 3. Molecules larger than the membrane pores of a cell could enter the
cell by the process of (1) diffusion (2) osmosis (3) pinocytosis
(4) cyclosis
- _____ 4. Potassium ions can pass easily through cell membranes, yet the potas-
sium ion concentration is higher inside many cells than outside. This is
probably due to (1) diffusion (2) active transport (3) osmosis (4)
pinocytosis
- _____ 5. A red blood cell placed in distilled water will swell and burst due to the
diffusion of (1) salt from the red blood cell into the water (2) water
into the red blood cell (3) water from the blood cell into its environ-
ment (4) salts from the water into the red blood cell
- _____ 6. Turgor occurs in plant cells as a result of (1) osmotic pressure (2)
plasmolysis (3) equilibrium (4) phagocytosis
- _____ 7. The net movement of molecules into cells is most dependent upon the
(1) selectivity of the plasma membrane (2) selectivity of the cell
wall (3) number of lysosomes (4) number of chromosomes
- _____ 8. Carbohydrate molecules A and B come in contact with the cell mem-
brane of the same cell. Molecule A passes through the membrane
readily, but molecule B does not. It is most likely that molecule A is
(1) a protein, and B is a lipid (2) a polysaccharide, and B is a mono-
saccharide (3) an amino acid, and B is a monosaccharide (4) a
monosaccharide, and B is a polysaccharide
- _____ 9. Roots and root hairs are plant structures that are specialized for (1)
photosynthesis and absorption (2) anchorage and photosynthesis
(3) photosynthesis and respiration (4) anchorage and absorption
- _____ 10. Unlike the cells of phloem, xylem cells are (1) living and transport
water (2) dead and transport water (3) dead and transport food
(4) living and transport food
- _____ 11. The leaf structures closely associated with transpiration are (1) lenti-
cels (2) stomates (3) waxy surfaces (4) elongated epidermal cells
- _____ 12. Which would most directly be affected in a plant if root pressure and
transpirational pull were not occurring? (1) the movement of water
into the leaves (2) the storage of food in the roots (3) the passage of
carbon dioxide through the epidermis (4) the release of energy from
glucose molecules
- _____ 13. A root hair cell may continue to absorb minerals even though the
cytoplasmic concentration of these minerals is greater inside the cell
than in the soil. This absorption is accomplished chiefly as a result of
(1) passive transport (2) active transport (3) diffusion (4) osmosis
- _____ 14. By which process do carbon dioxide molecules leave a plant and enter
the atmosphere? (1) digestion (2) osmosis (3) photosynthesis (4)
diffusion

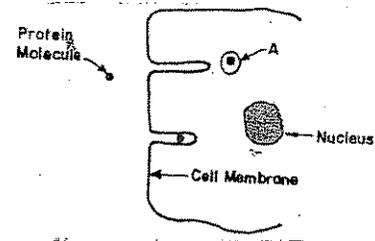
GENERAL TRANS

- Which process would include a net movement of sugar molecules through a membrane from a region of lower concentration to a region of higher concentration? (1) osmosis (2) cyclosis (3) active transport (4) passive transport
- In the human body, the potassium ion can pass easily through cell membranes, yet the potassium ion concentration is higher inside many cells than it is outside these cells. This condition is mainly a result of the process of (1) passive transport (2) active transport (3) osmosis (4) pinocytosis
- Chemical analysis indicates that the cell membrane is composed mainly of (1) proteins and starch (2) proteins and cellulose (3) lipids and starch (4) lipids and proteins
- The net flow of materials through the membrane of a cell against a concentration gradient is known as (1) passive transport (2) active transport (3) osmosis (4) pinocytosis
- A biologist observed a plant cell in a drop of water and illustrated it as in diagram A. He added a 10% salt solution to the slide, observed the cell, and illustrated it as in diagram B.



- The change in appearance of the cell resulted from more (1) salt flowing out of the cell than into the cell (2) salt flowing into the cell than out of the cell (3) water flowing into the cell than out of the cell (4) water flowing out of the cell than into the cell
- The natural streaming of the cytoplasm that occurs within all cells is called (1) pinocytosis (2) phagocytosis (3) osmosis (4) cyclosis
 - When a cell uses energy to move materials across a cell membrane, the process is known as (1) osmosis (2) active transport (3) diffusion (4) passive transport
 - The diffusion of water molecules into and out of cells is called (1) cyclosis (2) pinocytosis (3) osmosis (4) homeostasis
 - The net movement of molecules into cells is most dependent upon the (1) selectivity of the plasma membrane (2) selectivity of the cell wall (3) number of nucleoli (4) number of chromosomes
 - A red blood cell placed in distilled water will swell and burst due to the diffusion of (1) salt from the red blood cell into the water (2) water into the red blood cell (3) water from the blood cell into its environment (4) salts from the water into the red blood cell

Base your answers to questions 11 and 12 on your knowledge of biology and on the diagram below, which illustrates a process by which protein molecules may enter a cell.



- Which process is illustrated in this diagram? (1) pinocytosis (2) osmosis (3) diffusion (4) passive transport
- Structure A is most likely a (1) ribosome (2) mitochondrion (3) nucleolus (4) vacuole
- The process by which amoebas ingest food particles is called (1) pinocytosis (2) osmosis (3) phagocytosis (4) cyclosis
- Distinguish between active and passive transport.
- Research and describe the circumstances in which human body cells perform active transport.

QUESTIONS

TRANS. IN ORGANISMS

- The circulatory system of the earthworm is most similar in structure and function to that of a (1) hydra (2) protozoan (3) grasshopper (4) human
- Which organism contains an open circulatory system? (1) earthworm (2) grasshopper (3) hydra (4) amoeba
- How are nutrients transported from the blood of an earthworm to the muscle cells of its body wall? (1) The blood flows directly into the muscle cells. (2) The nutrients diffuse through capillary walls and through the cell membranes. (3) The nutrients pass through pores at the ends of nephridia. (4) The nutrients diffuse through the skin from the outside environment.
- Which organism has an internal, closed circulatory system that brings materials from the external environment into contact with its cells? (1) amoeba (2) paramecium (3) hydra (4) earthworm
- Materials are circulated within the cells of a hydra by (1) osmosis, only (2) osmosis and diffusion (3) cyclosis and diffusion (4) a transport system
- Hemoglobin is found in the blood of (1) humans and earthworms (2) earthworms and grasshoppers (3) grasshoppers and humans (4) humans, only
- A circulatory system in which the blood remains within vessels is called a(n) (1) closed circulatory system (2) open circulatory system (3) internal circulatory system (4) external circulatory system
- The intestinal fold of the earthworm and the villi of the human small intestine function primarily to (1) increase the surface area for absorption of digested nutrients (2) excrete metabolic wastes (3) circulate blood (4) force the movement of food in one direction through the digestive tract
- Pairs of aortic arches are found in the circulatory system of the (1) hydra (2) grasshopper (3) earthworm (4) paramecium

Think About It Compare and contrast the circulatory systems of the earthworm and the human. Why are both referred to as closed systems?