

CHAPTER 6 & 7 REVIEW

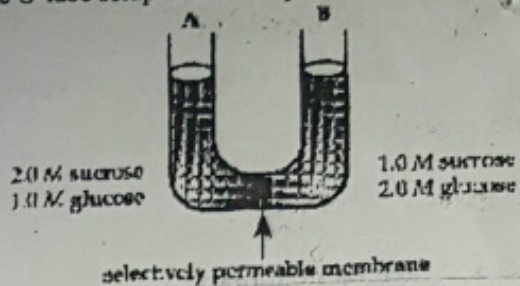
- Describe the plasma membrane
 - What is the difference between channel protein, transport protein, recognition proteins, receptor proteins, electron transfer proteins
 - What organelles are part of the endomembrane system
 - The functions of the organelles
 - 4 differences between animal and plant cells
 - Prokaryote vs. eukaryote
 - What substances can easily pass through the plasma membrane
 - 3 types of passive transport
 - 6 types of active transport
 - Osmotic pressure and osmotic potential
 - Hypotonic vs. hypertonic vs. isotonic solutions
1. The cellular structure that is involved in producing ATP during aerobic respiration is the
 - a. nucleus
 - b. nucleolus
 - c. chloroplast
 - d. mitochondrion
 - e. endoplasmic reticulum
 2. Which of the following cellular structures are common to both prokaryotes and eukaryotes?
 - a. ribosomes
 - b. nucleoli
 - c. chloroplasts
 - d. mitochondria
 - e. Golgi bodies
 3. The plasma membrane consists principally of
 - a. proteins embedded in a carbohydrate bilayer
 - b. phospholipids embedded in a protein bilayer
 - c. proteins embedded in a phospholipid bilayer
 - d. proteins embedded in a nucleic acid bilayer
 - e. proteins embedded in a polymer of glucose molecules
 4. When the concentration of solutes differs on the two sides of a membrane permeable only to water,
 - a. water will move across the membrane by osmosis
 - b. water will move across the membrane by active transport
 - c. water will move across the membrane by plasmolysis
 - d. water will move across the membrane by facilitated diffusion
 - e. solutes will move across the membrane from the region of higher concentration to the region of lower concentration
 5. All of the following characterize microtubules EXCEPT:
 - a. They are made of the protein tubulin.
 - b. They are involved in providing motility.
 - c. They are organized by basal bodies or centrioles.
 - d. They develop from the plasma membrane.
 - e. They make up the spindle apparatus observed during cell division in animals.
 6. Lysosomes are
 - a. involved in the production of fats
 - b. involved in the production of proteins
 - c. involved in the production of polysaccharides
 - d. often found near areas requiring a great deal of energy (ATP)
 - e. involved in the degradation of cellular substances
 7. Mitochondria
 - a. are found only in animal cells
 - b. produce energy (ATP) with the aid of sunlight
 - c. are often more numerous near areas of major cellular activity
 - d. originate from centrioles
 - e. are microtubule organizing centers
 8. The movement of molecules during diffusion can be described by all of the following EXCEPT:
 - a. Molecular movements are random.
 - b. Net movement of solute molecules is from a region of higher concentration to a region of lower concentration.
 - c. Each molecule moves independently of other molecules.
 - d. Solute molecules always move down the concentration gradient.
 - e. Net movement of gas molecules is from a region of higher concentration to a region of lower concentration.
 9. Plant and animal cells differ mostly in that
 - a. animal cells have mitochondria
 - b. animal cells have centrioles
 - c. the flagella and cilia of animal cells have a "9+2" doublet microtubule construction
 - d. plant cells have cell walls made from cellulose
 - e. plant cells have ribosomes attached to the endoplasmic reticulum

10. A smooth endoplasmic reticulum exhibits all of the following activities EXCEPT:
- assembling amino acids to make proteins
 - manufacturing lipids
 - manufacturing hormones
 - breaking down toxins
 - breaking down toxic cellular by-products
11. All of the following are known to occur in cell walls EXCEPT
- actin
 - chitin
 - polysaccharides
 - cellulose
 - peptidoglycans
12. A saturated suspension of starch is enclosed in a bag formed from dialysis tubing, a material which water can pass, but starch cannot. The bag with the starch is placed into a beaker of distilled water. All of the following are expected to occur EXCEPT:
- There will be a net movement of water from a hypotonic region to a hypertonic region.
 - There will be a net movement of solute from a hypertonic region to a hypotonic region.
 - There will be a net movement of water from a region of higher concentration of water to a region of lower concentration of water.
 - The dialysis bag with its contents will gain weight.
 - No starch will be detected outside the dialysis bag.
13. A tube covered on one end by a membrane impermeable to sucrose is inverted and half filled with distilled water. It is then placed into a beaker of 10% sucrose to a depth equal to the midpoint of the tube. Which of the following statements is true?
- The water level in the tube will rise to a level above the water in the beaker.
 - The water level in the tube will drop to a level below the water in the beaker.
 - There will be no change in the water level of the tube, and the water in the tube will remain pure.
 - There will be no change in the water level of the tube, but sucrose will enter and mix with the water in the tube.
 - The concentration of the sucrose solution will increase.
14. Which of the following is/are not found in a prokaryotic cell?
- ribosomes
 - plasma membrane
 - mitochondria
 - a and c
 - a, b, and c
15. Resolving power of a microscope is
- the distance between two separate points
 - the sharpness or clarity of an image
 - the degree of magnification of an image
 - the depth of focus on a specimen's surface
 - the wavelength of light
16. Which of the following is not a similarity among the nucleus, chloroplasts and mitochondria?
- They contain DNA.
 - They are bound by a double phospholipid bilayer membrane.
 - They can divide to reproduce themselves.
 - They are derived from the endoplasmic reticulum system.
 - Their membranes are associated with specific proteins.
17. The pores of the nuclear envelope provide for the movement of
- proteins into the nucleus
 - ribosomal components out of the nucleus
 - mRNA out of the nucleus
 - enzymes into the nucleus
 - all of the above
18. The ultrastructure of a chloroplast could be seen best using
- transmission electron microscopy
 - scanning electron microscopy
 - phase contrast microscopy
 - cell fractionation
 - darkfield microscopy
19. The largest number of bound ribosomes most likely would be found in a cell
- with a high metabolic rate
 - that produces secretory proteins
 - with many cilia
 - that produces steroids
 - that detoxifies poisons
20. Which structure is not considered to be part of the endomembrane system?
- peroxisome
 - smooth ER
 - nuclear envelope
 - lysosomes
 - Golgi apparatus
21. A growing plant cell elongates primarily by
- increasing the number of vacuoles
 - synthesizing more cytoplasm
 - taking up water into its central vacuole
 - synthesizing more cellulose
 - producing a secondary cell wall
22. The innermost portion of a mature plant cell wall is
- primary cell wall
 - secondary cell wall
 - middle lamella
 - plasma membrane
 - plasmodesmata
23. Contractile elements of muscle cells are
- intermediate filaments
 - centrioles
 - microtubules
 - actin filaments
 - fibronectins

24. Microtubules are components of all of the following EXCEPT:
- centrioles
 - the spindle apparatus for separating chromosomes in cell division
 - tracks along which organelles can move using motor molecules
 - flagella and cilia
 - the pinching apart of the cytoplasm in animal cell division
25. Of the following, which is probably the most common route for membrane flow in the endomembrane system?
- rough ER ---- Golgi ---- lysosomes ---- vesicles ---- plasma membrane
 - rough ER ---- transitional ER ---- Golgi ---- vesicles ---- plasma membrane
 - nuclear envelope ---- rough ER ---- Golgi ---- smooth ER ---- lysosomes
 - rough ER ---- vesicles ---- Golgi ---- smooth ER ---- plasma membrane
 - smooth ER ---- vesicles ---- Golgi ---- vesicles ---- peroxisomes
26. Proteins to be used within the cytosol are generally synthesized
- by ribosomes bound to rough ER
 - by free ribosomes
 - by the nucleolus
 - within the Golgi apparatus
 - by mitochondria and chloroplasts
27. Plasmodesmata in plant cells are similar in function to
- desmosomes
 - tight junctions
 - gap junctions
 - the extracellular matrix
 - integrins
28. In a cell fractionation procedure, the first pellet formed would most likely contain
- the extracellular matrix
 - ribosomes
 - mitochondria
 - lysosomes
 - nuclei
29. Glycoproteins and glycolipids are important for
- facilitated diffusion
 - active transport
 - cell-cell recognition
 - cotransport
 - signal-transduction pathways
30. A single layer of phospholipid molecules coats the water in a beaker. Which part of the molecules will face the air?
- the phosphate groups
 - the hydrocarbon tails
 - both head and tail because the molecules are amphipathic and will lie sideways
 - the phospholipids would dissolve in the water and not form a membrane coat
 - the glycolipid region
31. Which of the following is not true about osmosis?
- It increases free energy in a system.
 - Water moves from hypotonic to a hypertonic solution.
 - Solute molecules bind to water and decrease the water available to move.
 - It increases the entropy in a system.
 - There is no net osmosis between isotonic solutions.
32. Support for the fluid mosaic model of membrane structure comes from
- the freeze-fracture technique of electron microscopy
 - the movement of proteins in hybrid cells
 - the amphipathic nature of membrane proteins
 - both a and b
 - all of the above
33. A freshwater Paramecium is placed into salt water. Which of the following events would occur?
- an increase in the action of its contractile vacuole
 - swelling of the cell until it becomes turgid
 - swelling of the cell until it lyses
 - shriveling or crenation of the cell
 - diffusion of salt ions into the cell
34. Ions diffuse across membranes down their
- electrochemical gradient
 - electrogenic gradient
 - electrical gradient
 - concentration gradient
 - osmotic gradient
35. The fluidity of membranes in a plant in cold weather may be maintained by
- increasing the number of phospholipids with saturated hydrocarbon tails
 - activating a H^+ pump
 - increasing the concentration of cholesterol in the membrane
 - increasing the proportion of integral proteins
 - increasing the number of phospholipids with unsaturated hydrocarbon tails
36. A plant cell placed in a hypotonic environment will
- plasmolyze
 - shivel
 - become turgid
 - become flaccid
 - lyse
37. Which of the following is not true of the carrier molecules involved in facilitated diffusion?
- They increase the speed of transport across a membrane.
 - They can concentrate solute molecules on one side of the membrane.
 - They have specific binding sites for the molecules they transport.
 - They may undergo a conformational change upon binding of solute.
 - They may be inhibited by molecules that resemble the solute to which they normally bind.

38. The membrane potential of a cell favors the
- movement of cations into the cell
 - movement of anions into the cell
 - action of an electrogenic pump
 - movement of sodium out of the cell
 - action of a proton pump
39. Cotransport may involve
- active transport of two solutes through a transport protein
 - passive transport of two solutes through a transport protein
 - ion diffusion against the electrochemical gradient created by an electrogenic pump
 - first and second messengers in a signal-transduction pathway
 - transport of one solute against its concentration gradient in tandem with another that is diffusing down its concentration gradient
40. Exocytosis involves all of the following EXCEPT
- ligands and coated pits
 - the fusion of a vesicle with the plasma membrane
 - a mechanism to transport carbohydrates to the outside of plant cells during the formation of cell walls
 - a mechanism to rejuvenate the plasma membrane
 - a means of exporting large molecules
41. The proton pump in plant cells is the functional equivalent of an animal cell's
- cotransport mechanism
 - sodium-potassium pump
 - contractile vacuole for osmoregulation
 - receptor-mediated endocytosis of cholesterol
 - signal-transduction pathway
42. Pinocytosis involves
- the fusion of a newly formed food vacuole with a lysosome
 - receptor-mediated endocytosis and the formation of vesicles
 - the pinching in of the plasma membrane around droplets of external fluid
 - pseudopod extension as vesicles move along the cytoskeleton and fuse with the plasma membrane
 - the accumulation of specific large molecules in a cell
43. Watering a houseplant with too concentrated a solution of fertilizer can result in wilting because
- the uptake of ions into plant cells makes the cells hypertonic
 - the soil solution becomes hypertonic, causing the cells to lose water
 - the plant will grow faster than it can transport water and maintain a proper water balance
 - diffusion down the electrochemical gradient will cause a disruption of membrane potential and accompanying loss of water
 - the plant will suffer fertilizer burn due to a caustic soil solution

Use the U-tube setup to answer questions 44-46.



The solutions in the two arms of this U-tube are separated by a membrane that is permeable to water and glucose but not to sucrose. Side A is filled with a solution of 2.0 M sucrose and 1.0 M glucose. Side B is filled with 1.0 M sucrose and 2.0 M glucose.

44. Initially, the solution in side A, with respect to that in side B is
- hypotonic
 - hypertonic
 - isotonic
 - lower
 - higher
45. After the system reaches equilibrium, what changes are observed?
- The water level is higher in side A than in side B.
 - The water level is higher in side B than in side A.
 - The molarity of glucose is higher in side A than in side B.
 - The molarity of sucrose has increased in side A.
 - Both a and c have occurred.
46. During the period before equilibrium is reached, which molecule(s) will show net movement through the membrane?
- water
 - glucose
 - sucrose
 - water and sucrose
 - water and glucose

Use the following key for the next five questions. Each answer in the key may be used once, more than once, or not at all.

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|----------------------|---------------------------|
| (A) Active transport | (D) Facilitated diffusion |
| (B) Bulk flow | (E) Plasmolysis |
| (C) Osmosis | |

47. Movement of solutes across a plasma membrane from a region of higher solute concentration to a region of lower solute concentration with the aid of proteins.
48. Movement of water across a membrane from a region of higher concentration of water to a region of lower concentration.
49. Movement of water out of a cell resulting in the collapse of the plasma membrane.
50. Movement of urine through the urinary tract.
51. Movement of solutes across a plasma membrane requiring the addition of energy.

What are the appropriate cellular organelle or structure?

- Transport membranes and products to various locations
- Infolding of mitochondrial membrane with attached enzyme
- small sacs with specific enzymes for particular metabolic pathways
- stack of flattened sacs inside chloroplasts
- anchoring structure for cilia and flagella
- semifluid medium between nucleus and plasma membrane
- system of fibers that maintains cell shape, anchors organelles
- connection between animal cells that creates impermeable layer
- membrane surrounding central vacuole of plant cells