

LSEP_1_T2_Revision exercise

1. According to Poiseuille's Law, a small decrease in the radius of a blood vessel results in:
 - A. a large increase in blood viscosity.
 - B. a large increase in resistance to blood flow.
 - C. a small decrease in blood viscosity.
 - D. a small decrease in resistance to blood flow.
 - E. a small decrease in total blood vessel length.
2. The blood flow through blood vessel A is 10 ml/s. If the blood pressure remains the same and the radius of blood vessel A is doubled, the new blood flow of blood vessel A would be:
 - A. 2.5 ml/s.
 - B. 5 ml/s.
 - C. 20 ml/s.
 - D. 40 ml/s.
 - E. 160 ml/s.
3. What is the velocity of blood flowing through a blood vessel with cross sectional area of 4 cm^2 at a flow rate of 80 ml per second?
 - A. 5 cm per second
 - B. 20 cm per second
 - C. 40 cm per second
 - D. 80 cm per second
 - E. 120 cm per second
4. Cardiac output divided by heart rate equals:
 - A. blood pressure.
 - B. blood flow.
 - C. stroke volume.
 - D. total peripheral resistance.
 - E. velocity of blood flow.
5. Blood pressure
 - A. decreases when blood viscosity increase.
 - B. decreases when cardiac output increases.
 - C. increases when blood vessels of the body dilate.
 - D. increases when total peripheral resistance increases.
 - E. increases when stroke volume decreases.
6. What is the partial pressure of oxygen (with a relative abundance of 21%) if the total atmospheric pressure is 690 mmHg?
 - A. 69 mmHg
 - B. 145 mmHg
 - C. 210 mmHg
 - D. 545 mmHg
 - E. 760 mmHg
7. What is the partial pressure of CO_2 (with a relative abundance of 0.3%) if the total gas pressure is 550 mm Hg?
 - A. 1.65 mmHg
 - B. 16.5 mmHg
 - C. 55 mmHg
 - D. 110 mmHg
 - E. 165 mmHg

8. According to Boyle's law, at a constant temperature, the volume of a gas _____ as the pressure on the gas _____.
- A. decreases; decreases
 - B. increases; decreases
 - C. increases; increases
 - D. remains unchanged; increases
 - E. remains unchanged; decreases
9. According to Fick's first law of diffusion, solute moves:
- A. from a region of high concentration to low concentration.
 - B. from a region of low concentration to high concentration.
 - C. from a region with negative charge to positive charge.
 - D. from a region with positive charge to negative charge.
 - E. from the extracellular region to intracellular region.
10. Rate of diffusion of a solute increases when
- A. the concentration gradient decreases.
 - B. the diffusion distance increases.
 - C. the solute is less soluble.
 - D. the temperature decreases.
 - E. the total surface area for diffusion increases.
11. Which of the following statements best describes homeostasis?
- A. Keeping the internal environment of the body in a fixed and unaltered state.
 - B. Keeping the composition of intracellular fluid in a dynamic equilibrium.
 - C. Altering the external environment to accommodate the body's needs.
 - D. Maintaining a near-constant internal environment.
 - E. It is achieved through positive feedback mechanisms.
12. Which of the following is an example of physiological processes under positive feedback control?
- A. Formation of blood clot.
 - B. Effect of glucose level of glucagon secretion.
 - C. Effect of blood pressure on renin secretion.
 - D. Effect of oxygen level on erythropoietin secretion.
 - E. Regulation of body temperature.
13. Synthesis and release of most hormones is regulated by negative feedback control. Negative feedback means:
- A. a rise in hormone levels affects the target organ which act to inhibit further hormone release.
 - B. a rise in hormone levels affects the target organ which act to stimulates further hormone release.
 - C. hormonal level is kept at a constant level.
 - D. neural stimuli regulate the release of hormones.
 - E. the effect of hormones on the target organ does not control further hormone release.
14. Chemical signals that can only travel and act at a limited distance between different cells is known as
- A. autocrine signalling.
 - B. endocrine signalling.
 - C. hormonal signalling.
 - D. paracrine signalling.
 - E. neural signalling.
15. Secreted chemicals that act on the secreting cell itself or same type of cells nearby is known as
- A. autocrine signalling.
 - B. endocrine signalling.
 - C. hormonal signalling.
 - D. paracrine signalling.
 - E. neural signalling.

16. Secreted chemicals which travels in the blood stream to act on cells far away from the secreting cells is known as
- autocrine signalling.
 - endocrine signalling.
 - hormonal signalling.
 - paracrine signalling.
 - neural signalling.
17. Which of the following organelles breaks down unwanted intracellular materials?
- Golgi apparatus
 - Lysosomes
 - Mitochondria
 - Nucleus
 - Rough endoplasmic reticulum
18. Which organelle is connected to the nucleus?
- Golgi apparatus
 - Lysosome
 - Mitochondrion
 - Peroxisome
 - Rough endoplasmic reticulum
19. Which organelle has ribosomes attached?
- Golgi apparatus
 - Lysosome
 - Mitochondrion
 - Nucleus
 - Rough endoplasmic reticulum
20. What is the function of ribosomes?
- ATP synthesis
 - DNA replication
 - Lipid synthesis
 - Protein synthesis
 - DNA transcription
21. Which organelle contains DNA?
- Golgi apparatus
 - Mitochondrion
 - Peroxisome
 - Rough endoplasmic reticulum
 - Smooth endoplasmic reticulum
22. What is the function of centriole?
- Duplication of DNA before cell division.
 - Organize spindle fibers for separation of chromosome during cell division.
 - Read the message on RNA for production of protein synthesis.
 - Removal of hydrogen peroxide.
 - Synthesis of RNA using DNA as template.
23. Which of the following organelles is common to prokaryotic and eukaryotic cells?
- Lysosomes
 - Ribosomes
 - Mitochondria
 - Peroxisomes
 - Smooth endoplasmic reticulum

24. Which of the following organelles are abundant in cells responsible for producing steroid hormones?
- A. Ribosomes and lysosomes
 - B. Mitochondria and ribosomes
 - C. Smooth endoplasmic reticulum and Golgi apparatus
 - D. Rough endoplasmic reticulum and Golgi apparatus
 - E. Rough endoplasmic reticulum and lysosome
25. Which of the following correctly describes glycocalyx?
- A. Components of the glycocalyx are important markers for cell-cell recognitions and communication.
 - B. Components of the glycocalyx are important for controlling traffics of molecules across membrane.
 - C. It consists of the lipid moieties of membrane glycolipids and glycoproteins.
 - D. It consists of proteins coating the external surface of plasma membrane.
 - E. It consists of proteins coating the internal surface of plasma membrane.
26. Which of the following is required for facilitated diffusion to take place?
- A. Carrier carbohydrate
 - B. Carrier proteins
 - C. Energy
 - D. Enzymes
 - E. Na^+/K^+ ATPase
27. Osmosis refers to movement of _____ across a selectively permeable membrane from a solution of _____ to a solution of _____.
- A. solute particles; higher concentration; lower concentration.
 - B. solute particles; lower concentration; higher concentration.
 - C. water molecules; "higher water concentration"; "lower water concentration".
 - D. water molecules; "lower water concentration"; "higher water concentration".
 - E. water molecules; higher concentration; lower concentration.
28. The principle extracellular cation is
- A. Na^+
 - B. K^+
 - C. Ca^{2+}
 - D. Cl^-
 - E. HCO_3^-
29. Endocytosis is used by cells to
- A. ingest bacteria and cell debris.
 - B. secrete large molecules into the extracellular space.
 - C. secrete ions into the extracellular space.
 - D. take up nutrients.
 - E. remove waste products.
30. Which of the following types of molecules cross membrane by simple diffusion?
- A. Charged molecules.
 - B. Large molecules.
 - C. Lipid-soluble molecules.
 - D. Macromolecules.
 - E. Polar molecules.
31. Which of the following substances can directly pass through the lipid bilayer of the cell membrane?
- A. Amino acids
 - B. Glucose
 - C. Na^+
 - D. O_2
 - E. Protein

SAQ

1. A typical eukaryotic cell consists of plasma membrane, cytoplasm and nucleus.
 - (a) Briefly describe the structure of the plasma membrane.
 - (b) What are the functions of plasma membrane?
 - (c) DNA can be found in which intracellular structure(s)?
 - (d) Which organelle is physically connected to the nucleus?
 - (e) Which organelle is considered the powerhouse of the cell?

2. Cytoskeleton consists of network of protein filaments that extend throughout the cytoplasm.
 - (a) Name the THREE types of protein filaments that makes up the cytoskeleton.
 - (b) List the THREE functions of cytoskeleton.

3. Cilium and flagellum are hair-like organelles on cell surface.
 - (a) Briefly describe the structure of cilium and flagellum.
 - (b) What are the differences between cilium and flagellum?
 - (c) Give an example of cilium and flagellum.