

BIOL-1 Practice Test 02

Modules 5-8: Membranes through Cellular Respiration

Instructions: This practice test covers material from Modules 5-8. Answer all questions to the best of your ability.

Part A: Multiple Choice (25 questions)

Choose the best answer for each question.

Module 5: Membranes

1. The cell membrane is best described by the:
 - A) Lock and key model
 - B) Fluid mosaic model
 - C) Rigid barrier model
 - D) Simple lipid model

2. The cell membrane is primarily composed of:
 - A) Carbohydrates
 - B) Proteins only
 - C) Phospholipid bilayer
 - D) Nucleic acids

3. Phospholipids spontaneously form a bilayer in water because:
 - A) They are charged molecules
 - B) They have hydrophilic heads and hydrophobic tails
 - C) They are completely hydrophobic
 - D) They are all the same size

4. Cholesterol in the cell membrane functions to:

- A) Transport molecules across the membrane
- B) Help maintain membrane fluidity
- C) Store genetic information
- D) Produce ATP

5. Which transport process requires ATP?

- A) Diffusion
- B) Osmosis
- C) Facilitated diffusion
- D) Active transport

6. When a cell is placed in a hypotonic solution, water will:

- A) Move out of the cell
- B) Move into the cell
- C) Not move
- D) Move in both directions equally

7. A cell in an isotonic solution will experience:

- A) Net water movement into the cell
- B) Net water movement out of the cell
- C) No net water movement
- D) Cell lysis

Module 6: Metabolism

8. Enzymes function by:

- A) Increasing activation energy
- B) Decreasing activation energy
- C) Providing energy for reactions
- D) Changing the equilibrium of reactions

9. The molecule that stores and transfers energy in all cells is:

- A) Glucose
- B) ATP
- C) DNA
- D) NADH

10. The part of an enzyme where the substrate binds is called the:

- A) Allosteric site
- B) Active site
- C) Inhibitor site
- D) Product site

11. When an enzyme loses its shape due to heat or pH changes, this is called:

- A) Activation
- B) Denaturation
- C) Inhibition
- D) Catalysis

12. ATP releases energy when:

- A) A phosphate group is added
- B) A phosphate bond is broken (hydrolysis)
- C) It binds to DNA
- D) It is stored in the cell

13. Which statement about enzymes is TRUE?

- A) Enzymes are used up in reactions
 - B) Enzymes can be reused
 - C) Enzymes are made of carbohydrates
 - D) Enzymes increase the activation energy
-

Module 7: Photosynthesis

14. Where do the light-dependent reactions of photosynthesis occur?

- A) Stroma
- B) Thylakoid membranes
- C) Cytoplasm
- D) Mitochondria

15. Where does the Calvin cycle occur?

- A) Thylakoid membranes
- B) Stroma
- C) Cytoplasm
- D) Inner mitochondrial membrane

16. The Calvin cycle produces:

- A) Oxygen
- B) ATP
- C) Glucose (G3P)
- D) Water

17. Photosynthesis occurs in which organelle?

- A) Mitochondria
- B) Ribosomes
- C) Chloroplast
- D) Nucleus

18. The pigment that captures light energy in plants is:

- A) Hemoglobin
- B) Chlorophyll
- C) Melanin
- D) Carotene only

19. What is produced when water is split during the light reactions?

- A) Glucose
 - B) Carbon dioxide
 - C) Oxygen and electrons
 - D) ATP only
-

Module 8: Cellular Respiration

20. The net yield of ATP from glycolysis is:

- A) 0 ATP
- B) 2 ATP
- C) 4 ATP
- D) 36 ATP

21. Where does glycolysis occur?

- A) Mitochondrial matrix
- B) Cytoplasm
- C) Thylakoid
- D) Nucleus

22. Where does the Krebs cycle (citric acid cycle) occur?

- A) Cytoplasm
- B) Mitochondrial matrix
- C) Thylakoid
- D) Nucleus

23. The overall equation for cellular respiration shows that glucose and oxygen produce:

- A) Carbon dioxide and water
- B) Oxygen and glucose
- C) Light and ATP
- D) Protein and lipids

24. In the absence of oxygen, cells perform:

- A) Aerobic respiration
- B) Fermentation
- C) Photosynthesis
- D) Calvin cycle

25. In cellular respiration, most ATP is produced during:

- A) Glycolysis
 - B) Krebs cycle
 - C) Electron transport chain
 - D) Fermentation
-

Part B: Fill in the Blank (10 questions)

Write the correct term in the blank.

26. The phospholipid bilayer is described as a _____ mosaic model.

27. The process by which water moves across a membrane is called _____.

28. Transport that requires ATP is called _____ transport.

29. A solution with a lower solute concentration than the cell is called _____.

30. Photosynthesis occurs in the _____ of plant cells.

31. The products of the light reactions that are used in the Calvin cycle are ATP and _____.

32. The electron transport chain produces most of the _____ during cellular respiration.

33. The process of breaking down glucose without oxygen is called _____.

34. The byproduct released when water is split during photosynthesis is _____.

35. The final electron acceptor in the electron transport chain is _____.

Part C: Short Answer (5 questions)

Answer each question in 2-3 complete sentences.

36. Explain the difference between passive transport and active transport. Give one example of each.

37. Describe what happens to a cell placed in a hypertonic solution. How would this differ for a plant cell versus an animal cell?

38. Compare the light-dependent reactions and the Calvin cycle in terms of where they occur and what they produce.

39. Compare photosynthesis and cellular respiration in terms of their inputs and outputs.

40. Explain why we breathe oxygen and exhale carbon dioxide in terms of cellular respiration.

End of Practice Test 02