

AP Biology: Cell Membrane Practice Questions

Practice Test

Name: _____ Date: _____

Choose the best answer for each question.

Section 1 - Multiple Choice

1. The fluid mosaic model describes the cell membrane as:
 - A) A rigid lattice of proteins
 - B) A flexible bilayer of phospholipids with embedded proteins
 - C) A single layer of lipids
 - D) A protein sheet bonded to glucose
2. Which of the following moves freely across a phospholipid bilayer without a protein channel?
 - A) Sodium ions
 - B) Glucose
 - C) Water (slowly)
 - D) Large polar molecules
3. Active transport differs from facilitated diffusion because it:
 - A) Requires ATP and can move solutes against their gradient
 - B) Uses no proteins
 - C) Only moves water
 - D) Always moves solutes down their gradient
4. A red blood cell placed in a hypertonic solution will:
 - A) Swell and lyse
 - B) Stay the same
 - C) Shrink (crenate)
 - D) Divide rapidly
5. Cholesterol in animal cell membranes:
 - A) Increases membrane permeability to all solutes
 - B) Modulates fluidity over a range of temperatures
 - C) Replaces phospholipids
 - D) Only appears in plant cells

Answer Key

Section 1 - Multiple Choice

1. **B**

Phospholipid bilayer with proteins that move laterally — Singer and Nicolson, 1972.

2. **C**

Small uncharged molecules like O₂, CO₂, and slowly water can diffuse directly. Aquaporins speed water transport.

3. **A**

Active transport pumps solutes against the gradient using ATP. Facilitated diffusion is passive.

4. **C**

Water moves out of the cell toward the higher solute concentration, causing it to shrink.

5. **B**

Cholesterol stabilizes the membrane: it limits fluidity at high temperatures and prevents stiffening at low ones.