BIOL-1 Practice Test 02 — Answer Key

Modules 5-8: Membranes through Cellular Respiration

Part A: Multiple Choice Answers

Q	Answer	Explanation
1	B	The fluid mosaic model describes membrane structure
2	C	Cell membrane = phospholipid bilayer
3	B	Phospholipids have hydrophilic heads and hydrophobic tails
4	B	Cholesterol helps maintain membrane fluidity
5	D	Active transport requires ATP
6	B	Hypotonic = water moves INTO cell
7	C	Isotonic = no net water movement
8	B	Enzymes lower activation energy
9	B	ATP is the energy currency of cells
10	B	Substrates bind at the active site
11	B	Denaturation = loss of enzyme shape
12	B	ATP releases energy via phosphate hydrolysis
13	B	Enzymes can be reused (not consumed)
14	B	Light reactions occur in thylakoid membranes
15	B	Calvin cycle occurs in the stroma
16	C	Calvin cycle produces glucose (G3P)
17	C	Photosynthesis occurs in chloroplasts
18	B	Chlorophyll captures light energy
19	C	Water splitting produces O_2 and electrons

Q	Answer	Explanation
20	B	Glycolysis nets 2 ATP
21	B	Glycolysis occurs in cytoplasm
22	B	Krebs cycle occurs in mitochondrial matrix
23	A	Respiration produces CO_2 and H_2O
24	B	Without oxygen, cells perform fermentation
25	C	Most ATP comes from electron transport chain

Part B: Fill in the Blank Answers

Q	Answer
26	fluid
27	osmosis
28	active
29	hypotonic
30	chloroplast(s)
31	NADPH
32	ATP
33	fermentation
34	oxygen (O_2)
35	oxygen (O_2)

Part C: Short Answer Key

36. Passive vs. Active Transport:

- Passive transport: does not require energy (ATP); moves with concentration gradient (ex: diffusion, osmosis, facilitated diffusion)
- Active transport: requires energy (ATP); moves against concentration gradient (ex: sodium-potassium pump)

37. Cell in Hypertonic Solution:

- Water moves OUT of the cell (toward higher solute concentration)
- Animal cell: will shrink (crenation)
- Plant cell: will plasmolyze (cell membrane pulls away from cell wall), but cell wall prevents complete collapse

38. Light Reactions vs. Calvin Cycle:

- Light reactions: occur in thylakoid membranes; produce ATP, NADPH, and O_2
- Calvin cycle: occurs in stroma; uses ATP and NADPH to produce glucose (G3P)

39. Photosynthesis vs. Cellular Respiration:

- Photosynthesis: $CO_2 + H_2O + \text{light} \rightarrow \text{glucose} + O_2$ (builds glucose, stores energy)
- Cellular Respiration: $\text{glucose} + O_2 \rightarrow CO_2 + H_2O + \text{ATP}$ (breaks down glucose, releases energy)
- They are essentially opposite processes

40. Why We Breathe:

- We inhale oxygen because it is required as the final electron acceptor in the electron transport chain
- Without oxygen, the ETC cannot function and very little ATP can be produced
- We exhale CO_2 because it is a waste product released when pyruvate is broken down in the Krebs cycle

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End of Answer Key