

SBI 4U0 Biochemistry Unit Test Outline

Part A – Multiple choice - Knowledge - 25 marks:

Types of forces, functional groups, structures of lipids, carbs, proteins, nucleic acids, types of fats, condensation and hydrolysis, enthalpy reactions and graphs, types of enzyme inhibition.

Part B – Short Answer – Thinking – 17 marks:

Calculate enthalpy/bond energies for a reaction and sketch graph, explain exactly how an specific enzyme works, analyse graphs of enzyme action.

Part C – The Big Question – 25 marks (Communication 10 marks, Application 15 marks):

Prepare (ahead of time) a cohesive answer with diagrams and explanations of terms (on big ledger paper).

The Big Question (25 marks)

Complete this question on the ledger paper provided. Be sure to use diagrams as part of your answer.

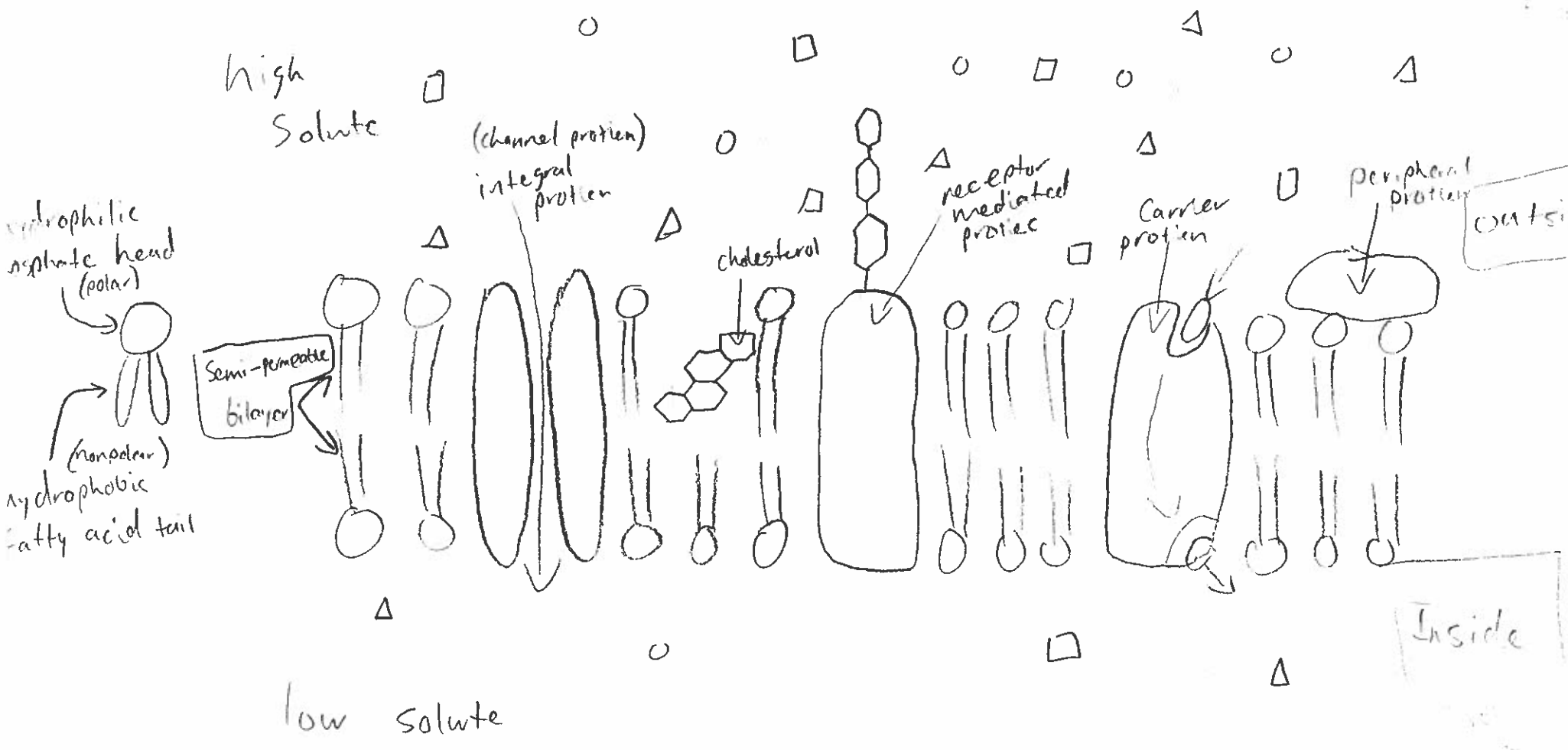
Question: The structure of the cell membrane and its ability to control the transport of materials into and out of the cell is key to many metabolic functions and overall cell survival. This also allows the cell to regulate the amount of water and dissolved materials inside the cell to maximize efficiency of its cellular machinery. **EXPLAIN HOW DIFFERENT COMPONENTS OF THE CELL MEMBRANE STRUCTURE ALLOW THE CELL TO CONTROL WHAT MATERIALS ARE TRANSPORTED INTO AND OUT OF THE CELL.**

Criteria:

- It is easier to get full marks if you use all the terms but not necessary. You may discuss other terms as well.
- You must use diagrams in your answer to receive full marks.
- You must describe the transport of at least 3 specific materials as part of your answer.
- It is vital that you connect your ideas together.
- Your answer must fit on one sheet of ledger paper, but you may use both sides.

Terms List:

Active transport	endocytosis/ receptor mediated	passive transport
ATP	equilibrium	peripheral protein
Bilayer	exocytosis	phospholipid
Carbohydrate	facilitated diffusion	polar
Carrier protein	hydrophilic	semi-permeable
Channel protein	hydrophobic	solute
Cholesterol	hypertonic	solvent
Concentration gradient	hypotonic	turgor pressure
Crenation/plasmolysis	integral protein	vesicles
Diffusion	isotonic	vacuoles
Osmosis	Na/K pump	volume



Large material

Why are there mechanisms necessary?

Small material

Water

osmosis is the movement of water from a high concentration to a low concentration

Passive transport: channel protein moving material in/out of cell with concentration gradient

does not require ATP

Active Transport: carrier protein moves the material in/out of cell against concentration gradient

requires ATP

eg. Na⁺/K⁺ pump

Endocytosis (phagocytosis) large particles that create vacuoles

requires ATP

membrane reaches out to grab particle

large vacuole forms

Exocytosis: large material leaving cell

cholesterol: small enough to fit through bilayer, receptor proteins "acknowledging" was there

hydrophobic like interior

Gases: small enough to separate bilayer and squeeze through

eg. O₂, CO₂

Endocytosis (pinocytosis) small vesicles created when small material enters cell

requires ATP

membrane reaches out to grab material

small vesicle forms inside

Exocytosis: small material that leaves cell

material forces its way out

hypertonic: more water leaves cell than enters through facilitated diffusion

H₂O volume ↓

crenation can occur

hypotonic: more water enters cell than leaves through facilitated diffusion

H₂O volume ↑

Cytolysis can occur in animal cells

Isotonic: when same amount of water on each side, happens when equilibrium is reached

good job being brief + to the point

but - you didn't connect them well to the question asked

osmosis/diffusion will stop once equilibrium is reached