Membranes
Learning Aid

1. Draw a diagram of a cell membrane and label all its component, including lipids, proteins, and carbohydrates. Specify its hydrophobic and hydrophilic regions. Include the short chains sugars.

2. Membrane fluidity is crucial for membrane function. List the factors that affect membrane fluidity and explain how each factor increases or decreases fluidity. Why is the presence of cholesterol crucial for animal but not for plant cells?

3. How does membrane structure affect its permeability of non-polar and polar substances (small & large)?

4. Explain the difference between active and passive transport in terms of concentration gradient and use of ATP. Differentiate between diffusion, facilitated diffusion, and osmosis.

5. What are osmotically active substances (OASs) and how do they affect water movement across membranes? How does the concentration of OASs in isotonic, hypotonic, and hypertonic solutions compare with the internal contents of the cell, and how does that affect the direction of water diffusion?

6. Compare and contrast membrane transporters with enzymes in terms of catalysis, specificity, saturation, activation, and inhibition.

7. How are large macromolecules transported across plasma membrane? Compare endocytosis with exocytosis, and phagocytosis and pinocytosis with receptor-mediated endocytosis.