

Cell Membranes and Transport across Membranes

- 1) Draw a diagram to illustrate the cell surface membrane; label the different parts. (5)
- 2) What are the functions of the following parts of the cell membrane? (5)
 - a. Cholesterol
 - b. Glycoproteins
 - c. Channel proteins
 - d. Carrier proteins
 - e. Phospholipids
- 3) Why is the cell membrane referred to as a phospholipid bilayer and fluid mosaic? (4)
- 4) What are the functions of the cell membrane? (4)
- 5) Explain the roles of the following different proteins in the cell membrane; extrinsic, intrinsic, transmembrane, carrier and channel proteins? (5)
- 6) Define the following terms; (16)
 - a. Diffusion
 - b. Facilitated Diffusion
 - c. Osmosis
 - d. Active Transport
 - e. Endocytosis
 - f. Exocytosis
 - g. Phagocytosis
 - h. Pinocytosis
- 7) What are the two different components which make up water potential? Define each one separately. (4)
- 8) What are the differences between;
 - a. Facilitated diffusion and active transport? (4)

- b. Endocytosis and exocytosis? (2)
- 9) Suggest how each of the following molecules will be transported across the cell surface membrane and give reasons why (10);
- a. Oestrogen
 - b. Glucose
 - c. Amino acids
 - d. Oxygen
 - e. Proteins
 - f. Sodium ions
 - g. Urea
 - h. Calcium ions
 - i. Water
 - j. Insulin
- 10) What factors affect the rate of diffusion and why? (4)
- 11) What is Fick's law and why is it relevant? (3)
- 12) What are the symbol and units for water potential? (2)
- 13) Why is water potential always negative? (1)
- 14) Explain how dialysis illustrates the transport across membranes mechanism? (3)
- 15) Draw a graph of rate of diffusion against concentration of substance for each of the following and explain each (6);
- a. Simple diffusion
 - b. Facilitated diffusion
 - c. Active Transport
- 16) What is the V_{max} and why is it important? (2)
- 17) Draw another graph to show how active transport and facilitated diffusion can be distinguished and label the axis? (2)

18) Why do lipid soluble substances diffuse across the membrane readily but not polar, water soluble molecules? (2)

Total: **/84**