BIOLOGY
Worksheet

LW10 - FACTORS AFFECTING PERMEABILITY

Q1) One effect of high temperature on the cell membrane is that it can influence permeability by disrupting the phospholipid bilayer.

a) Explain how this happens?

[3 marks]

b) Outline the role of channel proteins in the cell membrane.

[1 mark]

c) Explain what effect does high temperature have on proteins embedded within the cell membrane?

[2 marks]

Q2) Low temperature also influences the permeability of cell membranes.

a) Explain why it is harder for essential molecules to rapidly diffuse through the membrane at lower temperatures?

[3 marks]

b) How do freezing cold temperatures affect the permeability of the cell membrane?

[2 marks]

c) Which of the following statements is correct?

A The energy of phospholipids is greater at lower temperature ⬭

B The permeability of membranes increases at high temperature ⬭

C More molecules can enter and leave the cell at low temperature ⬭

D High temperature has no significant effect on membrane structure ⬭

[1 mark]

Q3) Solvents also affect the permeability and the structure of cell membranes.

a) What effect do high levels of solutes have on the permeability of cell membranes?

[1 mark]

b) Explain why solutes have this effect on the cell membrane?

[2 marks]

c) Why are certain solutes able to dissolve between phospholipids?

[2 marks]

Q4) Fatty acid tails in phospholipids can be either saturated or unsaturated.

a) Outline two differences between saturated phospholipid tails and unsaturated phospholipid tails.

b) Which of the following statements is correct? **[4 marks]**

A Unsaturated molecules contain only double/ triple bonds ⬭

B Saturated molecules contain double/ triple bonds ⬭

C Unsaturated molecules only contain single bonds ⬭

D Saturated molecules only contain single bonds ⬭

[1 mark]

c) Explain the effect of a high concentration of unsaturated phospholipid tails on the cell membrane.

[4 marks]

d) Describe the arrangement of saturated phospholipid tails and how this affects permeability of the cell membrane?

[3 marks]

Q5) The role of cholesterol in the cell membrane is dependent on the temperature.

a) What is the role of cholesterol?

[1 mark]

b) Explain how cholesterol resists the effects of high temperatures

[2 marks]

c) How does this effect the permeability of the cell membrane?

[1 mark]

[TOTAL 33 MARKS]