OCR
Oxford Cambridge and RSA

A Level Biology A

H420/02 Biological Diversity

Question Set 19

1 Lipids are an important group of biological molecules.

(a) Lipoproteins are roughly-spherical structures that transport lipids in the blood.

Fig. 21 shows a simplified drawing of a section from the widest part of a lipoprotein.

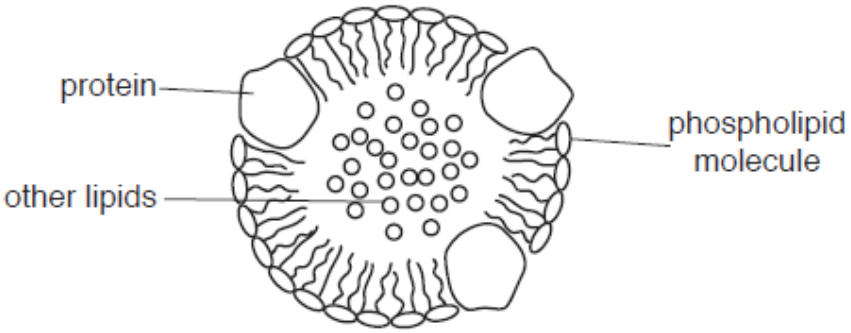

Fig. 21

(i) Calculate the number of phospholipid molecules in the outer surface of the lipoprotein shown in Fig. 21.

Assume that the pattern of proteins and phospholipids shown in Fig. 21 is continued across the whole surface of the lipoprotein.

Use the formula: Surface area of sphere = $4\pi r^2$

number of phospholipid molecules =.....

[2]

(ii) Lipoproteins with fewer phospholipids and more protein in the outer layer are known as high density lipoproteins.

Lipoproteins with a larger number of phospholipids but less protein are known as low density lipoproteins.

Use this information to explain why lipids can increase the buoyancy of aquatic animals.

[1]

(b) Complete the passage by choosing the most appropriate word from the list.

bile carbon hydrogen insoluble

nitrogen oxygen permeability production solid

soluble stability storage vitamins

Lipids have many roles in living organisms. Some are used for energy …….. in adipose cells. Unsaturated fatty acids contain at least one double bond between two ..... atoms and so contain fewer ..... atoms. All lipids are ..... in water so need to be transported in the blood by lipoproteins. Cholesterol molecules increase the ……. of membranes, and cholesterol is also used to synthesise steroid hormones and ..... .

[6]

(c) Triglycerides are a type of lipid molecule that can be broken down during hydrolysis reactions.

Using the structure of triglyceride molecules as an example, explain what is meant byhydrolysis.

[2]

Total Marks for Question Set 19: 11