**Question 1**

*Answer:* B

*Explanation:*

It is the concentration of glucose in blood that is commonly referred to the ‘blood-sugar level’

**Question 2**

*Answer:* A

*Explanation:*

Carotene and vitamin C are well known antioxidant present in berries, citrus fruits and beans

**Question 3**

*Answer:* D

*Explanation:*

A fatty acid reacts with each of the three –COOH groups on the glycerol molecule to form the triglyceride. Therefore, when hydrolysed there are three fatty acids and one glycerol molecule.

**Question 4**

*Answer:* B

*Explanation:*

Water is required for hydrolysis. For 27000 units, 26999 molecules of water would be required.

**Question 5**

*Answer:* D

Pepsin operates on protein first in the stomach. The stomach is an acidic environment. Trypsin finishes hydrolysis in the intestine where the pH is higher.

**Question 6**

*Answer:* A

*Explanation:*

Amylopectin has long chains with occasional crosslinks. Both of these types of bonds have to be broken. They are covalent bonds.

**Question 7**

*Answer:* B

*Explanation:*

Fats are slow to digest. They also slow the rate of enzymes working on other macronutrients. This causes a food to release its energy more slowly.

**Question 8**

*Answer:* C

*Explanation:*

The diagram shows fats being emulsified to form smaller particles that can be hydrolysed by enzymes.

**Question 9**

*Answer:* A

*Explanation:*

Sucrose is a disaccharide that will be broken down to glucose and fructose by the enzyme sucrase

**Question 10**

*Answer:* C

*Explanation:*

An enzyme should work repeatedly. The substrate leaves the enzyme and its original shape is restored.

**SECTION B: Short-answer questions**

**Question 1**

**a**.

|  |  |  |  |
| --- | --- | --- | --- |
|  | protein | carbohydrate | triglyceride |
| linkage to be broken(draw linkage) |  O H || |* C – N -
 | * C – O – C -
 |  O ||* C – O -
 |
| basic units formed | amino acids | monosaccharides  | fatty acid and glycerol |

6 marks

**b**. There are many important enzymes used by the body during digestion. Outline the role of

 each of the following

 **i**. amylase: in saliva – breaks starch to smaller polysaccharides

 **ii**. lactase: breaks disaccharide lactose to monosaccharides

  **iii**. cellulase: breaks cellulose to smaller polysaccharides

1 + 1 + 1 = 3 marks

Total 9 marks

**Question 2**

1. The three ester linkages should be circled on the diagram.

1 mark

1.
2. Water or H2O
3. Glycerol + 3 Stearic acid molecules
4. Saturated. Saturated fatty acids have the general formula CnH2n+1COOH.
5. Functional groups present are:
* OH on glycerol
* COOH on fatty acids

1 + 2 + 2 + 2 = 7 marks

Total 8 marks

**Question 3**

**a. i**. Vitamin A is not water-soluble\*. The lack of hydroxyl bonds leads to few hydrogen

 bonds forming with water.\*

  **ii**. Vitamin A will be stored for significant periods. It is stored in fatty tissue until the body

 requires it. Water-soluble vitamins are more likely to be lost from the body in urine.

 **iii**. Vitamins do not have a common structure. Their common feature is the role they play in

 protecting the body from disease.

2 + 1 + 1 = 4 marks

**b**. A coenzyme is not an enzyme. Rather, it is a smaller molecule that aids the functioning of

 an enzyme.

1 mark

Total 5 marks

**Question 4**

**a. i**. polypetide

 **ii**. pepsin or trypsin

1 + 1 = 2 marks

**b**. glycine alanine serine



1. marks
2. Transported to other parts of the body to be reassembled to form new protein or used for energy.

1 mark

Total 6 marks

**Question 5**

**a. i**. C 10H18O2

 **ii**. An omega-3 fatty acid has a double carbon-to-carbon bond on the third carbon from the

 end of the chain – the methyl end of the chain.

1 + 2 = 3 marks

**b. i**. Fatty acids are relatively non-polar due to the long hydrocarbon chain. The stomach is a

 polar environment not interacting greatly with fats.

 **ii**. When a fat forms an emulsion it is broken into much smaller particles. The surface area

 is increased and enzymes have a better chance of reacting with the fat. An emulsion relies

 on the presence of an emulsifying agent to stabilize smaller particles.

1 + 2 = 3 marks

**c.**  **i**. Rancidity is deterioration to form smaller molecules with unpleasant taste or odour.

 **ii**. Unsaturated fatty acids are more prone to rancidity.



  **iii**.

 The carbon adjacent to the double bond is a likely spot for attack

 **iv**. Propagation refers to the fat that a free radical can cause a free radical to form on a

 neighbouring molecule. One rancidity starts it is difficult to stop or slow.

1 + 1 + 1 + 1 = 4 marks

Total 10 marks