**B3 Organisation and the digestive system SLOP**

Spec points 4.2.1 – 4.2.2.1

**B3.1 Tissues and organs**

1. Rearrange the following parts of the body in the correct organisation levels: (1)
Tissue Organ system Cell Organism Organ
2. Define ‘tissue’. (2)
3. Define ‘organ’. (2)
4. The stomach contains mainly three types of tissues. State their functions. (3)
a.) Muscular tissue
b.) Glandular tissue
c.) Epithelia tissue
5. Decide for each of the following if they are a specialised cell, tissue or organ. Explain and state their functions. (6)
a.) Pancreas
b.) Neurone
c.) Kidney
6. Give three examples of organ systems in the body. For each of them, list three organs involved in that system. (9)

**B3.2 The human digestive system**

1. What is digestion? (1)
2. Why is digestion important to us? (1)
3. Label the digestive system. (11)

1. On the labelled diagram above, annotate each organ with their functions. (11)
2. Explain why the digestive system is an organ system. (2)
3. Describe and explain the adaptations of the small intestine to help with nutrient absorption. (4)
4. State the functional difference between the small and large intestines. (2)
5. How is the liver important in helping digestion? (2)

**B3.3 The chemistry of food**

**Carbohydrates**

1. Give two functions of carbohydrates. (2)
2. Which atoms make up carbohydrates? (1)
3. State the monomer (the basic unit) of carbohydrates. (1)
4. State the chemical formula of glucose. (1)
5. Give two examples of complex carbohydrates. (2)
6. What types of food contain lots of carbohydrates? Give three examples. (3)
7. Describe a test for starch. (2)
8. Describe how you would carry out a test for sugars. (4)

**Lipids**

1. What are the two types of lipids? (2)
2. Which atoms make up lipids? (1)
3. State two functions of lipids. (2)
4. Draw a labelled diagram to illustrate the structure of a lipid molecule. (2)
5. What types of food contain lots of lipids? Give two examples. (2)
6. Describe how you would carry out a test for lipids. (3)

**Proteins**

1. Give two functions of proteins. (2)
2. Which atoms make up proteins? (1)
3. What makes up proteins? (1)
4. Describe how different proteins can be made. (3)
5. Describe how you would carry out a test for proteins. (2)

**Summary task**

Draw a summary table, including a description, uses in living organisms and sources in our diet for all three types of biological molecules.

**B3.4 Catalysts and enzymes**

1. What are enzymes? (2)
2. What is the active site of an enzyme? (1)
3. Match the following keywords with their functions.

|  |  |
| --- | --- |
| Catalyst | The enzyme and substrate bound together. |
| Enzyme | The special site in the structure of an enzyme where the substrate binds. |
| Enzyme-substrate complex | The energy needed for a chemical reaction to take place. |
| Activation energy | A substance which changes the rate of a chemical reaction without being changed itself. |
| Active site | A biological catalyst. |

1. Draw a labelled diagram to illustrate the lock-and-key model of enzyme mechanism.
2. Define ‘metabolism’. (1)
3. Describe the three types of metabolic reactions. Give one example for each of them. (6)

**B3.5 Factors affecting enzyme action**

1. What does denaturation mean? (2)
2. What happens to enzymes when the temperature is: (2)
a.) Too low
b.) Too high
3. Draw an annotated graph to illustrate the effects of temperature on enzyme RoR. (5)
4. Explain the effects of temperature on enzyme action. (5)
5. What is the optimum temperature for enzymes in the human body? (1)
6. How does a change in pH cause enzymes to denature? (3)
7. Using the graph given, calculate the rate of reaction of the enzyme. Remember to include units. (2)

**B3.6 How the digestive system works**

1. Name the types of enzymes that catalyse the breakdown of: (3)
a.) Carbohydrates
b.) Lipids
c.) Proteins
2. Which organs in the digestive system produce digestive enzymes?
3. Complete the following table. There may be more than one answer needed in some boxes. (17)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Enzymes** | **Substrate** | **Products** | **Produced in…** | **Works in…** |
|  | Starch |  |  |  |
|  | Proteins |  |  |  |
|  | Lipids |  |  |  |

1. What is pepsin? (1)
2. What is the difference between pepsin and pancreatic amylase? (2)
3. What is the difference between pepsin and proteases produced by the pancreas? (2)
4. Draw a graph to illustrate how pH affects the actions of pepsin and lipase. (4)
5. Describe how to carry out an investigation to find the optimum pH for amylase. (6)

**B3.7 Making digestion efficient**

1. What are the functions of hydrochloric acid in the stomach? (2)
2. How is the stomach adapted to protect itself from pepsin and the hydrochloric acid? (1)
3. Following from Q2, what disease may develop if the stomach loses such adaptation? (1)
4. Suggest the optimum pH for enzymes to work in the small intestine. (1)
5. Which organ produces bile? (1)
6. Where is the bile stored before it is mixed with the food from the stomach? (1)
7. Describe and explain the functions of bile. (4)
8. Why is emulsification important to lipid digestion? (3)
9. Is it correct to say “the stomach produces hydrochloric acid to digest food”? Why/Why not? (2)
10. Is it correct to say “bile breaks down lipids to glycerol and fatty acids”? Why/Why not? (3)