

Q1.a)(2018)

Table 8

[3 marks]

Q1.b)(2018)

[6 marks]

[illegible]

Q2.a)(2018)

A scientist investigated the effect of bile on the breakdown of fat in a sample of milk.

The scientist used an indicator that is colourless in solutions with a pH lower than 10, and pink in solutions with a pH above 10.

This is the method used.

1. Add 1 drop of bile to a test tube and one drop of water to a second test tube.
2. Add the following to each test tube:
 - 5 cm³ of milk
 - 7 cm³ of sodium carbonate solution (to make the solution above pH 10)
 - 5 drops of the indicator
 - 1 cm³ of lipase.
3. Time how long it takes for the indicator in the solutions to become colourless.

The results are shown in **Table 9**.

Table 9	
	Time taken for the indicator to become colourless in seconds
Solution with bile	65
Solution without bile	143

Explain why the indicator in both tubes became colourless.

[3 marks]

Q2.b)(2018)

Give the reason why the measurement of the time taken for the indicator to become colourless might be inaccurate.

[1 mark]

Q2.c)(2018)

Explain the difference in the results for the two test tubes in **Table 9**.

[3 marks]

Q3.(2019)

Pancreatic cancer develops when a malignant tumour grows inside the pancreas.

The pancreas produces digestive enzymes.

What is an enzyme?

[2 marks]

Q4.(2019)

Carbohydrase is an enzyme produced by the pancreas.

Name **two** other organs in the digestive system that produce carbohydrase.

[2 marks]

1

2

Q5.(2019)

One symptom of pancreatic cancer is weight loss.

Explain how pancreatic cancer may cause a person to lose weight.

Do **not** refer to hormones in your answer.

[4 marks]

Q6.(2020)

Lipases break down lipids.

Which **two** products are formed when lipids are broken down?

[2 marks]

Tick (✓) **two** boxes.

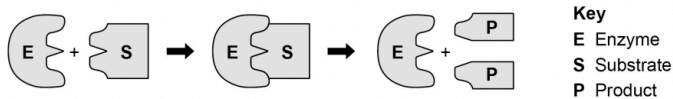
Amino acids	☐
Fatty acids	☐
Glucose	☐
Glycerol	☐
Glycogen	☐

Q7.(2020)

One model used to explain enzyme action is the 'lock and key theory'.

Figure 7 shows a model of the theory.

Figure 7



Explain the 'lock and key theory' of enzyme action.

Use information from **Figure 7** in your answer.

[3 marks]

Q8.(2020)

There are many different types of lipase in the human body.

Why does each different type of lipase act on only **one** specific type of lipid molecule?

[1 mark]

Q9.(2021)

Amylase is an enzyme that breaks down starch.

Amylase is a polymer of smaller molecules.

Name the type of smaller molecule.

[1 mark]

Q10.(2021)

Name the **three** parts of the human digestive system that produce amylase.

[2 marks]

1 _____

2 _____

3 _____

Q11.(2021)

Explain how amylase breaks down starch.

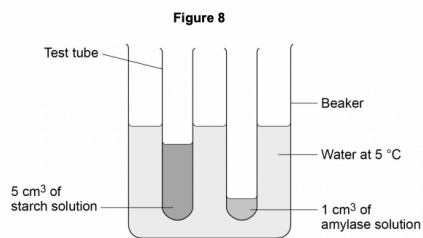
Answer in terms of the 'lock and key theory'.

[3 marks]

Q12.a)(2021)

A student investigated the effect of temperature on the activity of amylase.

Figure 8 shows the apparatus used.



This is the method used.

1. Set up the apparatus as shown in **Figure 8**.
2. After 5 minutes, pour the starch solution into the amylase solution and mix.
3. Remove one drop of the starch-amylase mixture and place onto a spotting tile.
4. Immediately add two drops of iodine solution to the starch-amylase mixture on the spotting tile.
5. Record the colour of the iodine solution added to the starch-amylase mixture.
6. Repeat steps 3 to 5 every minute until the iodine solution stays yellow-brown.
7. Repeat steps 1 to 6 using water at different temperatures.

Name **two** control variables the student used in the investigation.

[2 marks]

1 _____

2 _____

Q12.b)(2021)

Why did the student leave the starch solution and amylase solution for 5 minutes before mixing them?

[1 mark]

Q12.c)(2021)

Table 3 shows the results of the investigation.

Table 3

Temperature in °C	Time taken until iodine solution stays yellow-brown in minutes
5	did not become yellow-brown
20	5
35	2
50	7
65	14
80	did not become yellow-brown

What conclusion can be made about the effect of temperature on amylase activity between 20 °C and 65 °C?

[1 mark]

Q12.d)(2021)

Explain the results at 5 °C and at 80 °C.

Use **Table 3**.

[5 marks]

Q12.e)(2021)

The student investigated the effect of temperature on amylase activity.

Describe how the student could extend the investigation to determine the effect of a different factor on amylase activity.

[2 marks]

Q13.(2022)

Some types of fungal cell are grown to produce high-protein food.

The high-protein food can be used to make meat-free burgers.

Where is protein digested in the human digestive system?

[1 mark]

Tick (✓) **one** box.

Large intestine

☐

Liver

☐

Salivary glands

☐

Stomach

☐

Q14.(2022)

Which chemical could be used to test if the burgers contain protein?

[1 mark]

Tick (✓) **one** box.

Benedict's reagent

☐

Biuret reagent

☐

Ethanol

☐

Iodine solution

☐

Q15.(2022)

Table 3 shows some information about burgers made from meat and meat-free burgers.

Table 3

	Mass per 100 g of burger	
	Burgers made from meat	Meat-free burgers
Protein in g	14.0	9.0
Fibre in g	0.9	5.5
Fat in g	16.0	5.2
Carbohydrate in g	15.5	15.1
Cholesterol in mg	120.0	0.0

Evaluate the use of burgers made from meat compared with meat-free burgers in providing humans with a healthy, balanced diet.

Use information from **Table 3** and your own knowledge.

[6 marks]

Q16.(2024)

Organisation

<http://www.pcfgstudy.com>

The pancreas produces several digestive enzymes.

CF reduces the amount of each enzyme that reaches the small intestine.

Explain why a person with CF has:

- difficulty digesting food
- difficulty gaining body mass.

[6 marks]

Q17.a)(2024)

Cake and bread each contain the same two types of carbohydrate.

Describe the chemical tests that could be used to show the presence of the two types of carbohydrate in cake.

Include a risk assessment in your answer.

[6 marks]

Q17.b)(2024)

Organisation

<http://www.pcfgstudy.com>

A student investigated three types of bread.

For each type of bread, the student:

- put a square piece of bread into their mouth
- did **not** chew the bread
- recorded the time taken for the bread to taste sweet.

Table 2 shows the results.

Table 2

Type of bread	Time taken for bread to taste sweet in seconds
Brown	43
White	35
Wholemeal	57

What was the dependent variable in the investigation?

[1 mark]

Q17.c)(2024)

Give **one** control variable the student should have used in the investigation.

[1 mark]

Q17.d)(2024)

During the investigation, the bread began to taste sweet in the student's mouth.

Explain why the bread tasted sweet.

[3 marks]

Q17.e)(2024)

Suggest **one** reason why the results of the investigation were **not** valid.

Do **not** refer to control variables in your answer.

[1 mark]
