Collins

AQA

GCSE

Biology

H

SET B – Paper 1 Higher Tier

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Materials

Time allowed: 1 hour 45 minutes

For this paper you must have:

- a ruler
- a calculator.

Instructions

- Answer **all** questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- There are 100 marks available on this paper.
- The marks for questions are shown in brackets.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.
- When answering questions 07.3 and 09.3 you need to make sure that your answer:
  – is clear, logical, sensibly structured
  – fully meets the requirements of the question
  – shows that each separate point or step supports the overall answer.

Advice

- In all calculations, show clearly how you work out your answer.

Name: .....

01 Herbivores, pests and pathogens often destroy leaves and other parts of the plant.

Plant defences minimise this damage.

01.1 Which of the following is a **chemical** plant defence response?

Tick **one** box.

Bark ☐

Cellulose cell walls ☐

Poison ☐

Waxy cuticle ☐ **[1 mark]**

01.2 Describe the action of **two mechanical** plant defence responses.

Explain how each of them works.

.....

.....

.....

..... **[4 marks]**

01.3 Name **two** non-specific physical or chemical barriers that defend the body from infection.

..... **[2 marks]**

01.4 Describe **two** ways white blood cells help defend the human body against pathogens.

.....

..... **[2 marks]**

02 Pathogens cause diseases in plants and animals.

Plants and animals are able to defend themselves against attack.

02.1 Name a plant disease that is caused by a virus.

.....

[1 mark]

02.2 Explain how this virus affects the whole plant.

.....

.....

.....

[3 marks]

02.3 Name a plant disease that is caused by a fungus.

.....

[1 mark]

02.4 Plants can also be damaged by ion deficiency.

Name an ion deficiency condition in plants.

Describe **one** effect of this deficiency.

Explain why this effect occurs.

.....

.....

.....

[3 marks]

Turn over >

03 The digestive system is a collection of organs that work together to digest and absorb food.

03.1 What is the name given to biological molecules that break down our food?

Tick **one** box.

Catalysts ☐

Enzymes ☐

Proteins ☐

Substrate ☐ **[1 mark]**

03.2 Tom ate a sausage sandwich.

Complete the following sentences:

- Proteases break down ..... to ..... .
- Lipases break down ..... to glycerol and

.... **[4 marks]**

03.3 Amylase is a carbohydrase that breaks down starch to maltose and glucose.

Tom investigated the effect of pH on the rate of reaction of amylase.

This is the method used.

1. Gather three solutions:

- amylase
- starch solution
- pH buffer solution.

2. Set up a spotting tile with rows of iodine drops and prepare the stopwatch.

3. Mix the three solutions in a test tube in a particular order and start the stopwatch.

Which is the correct order to put the solutions into the test tube?

.....

[1 mark]

03.4 Explain why it is important that Tom mixed the solutions in the correct order.

.....

.....

.....

[2 marks]

03.5 At 10 second intervals, Tom used a pipette to place a drop of the 3 solutions mix onto the next iodine drop in the spotting tile.

He repeated this until the iodine remained orange after the mix was added.

Describe how Tom could set up a colour control.

.....

.....

[1 mark]

03.6 Why might a control have helped Tom?

.....

.....

.....

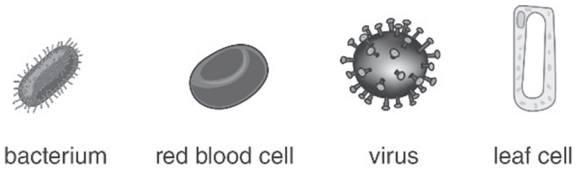
[2 marks]

Turn over >

04 **Figure 4.1** shows a virus and some different cells.

The diagrams are **not** to scale.

Figure 4.1



04.1 Write the items in order of their size, from the smallest to the largest.

Smallest .....

.....

.....

Largest ..... **[1 mark]**

04.2 Give **two** reasons for using a coverslip when looking at a slide under the microscope.

.....

..... **[2 marks]**

04.3 When using a microscope, describe the difference between the field of view of a low-power lens with the field of view of a high-power lens.

Explain what causes this difference.

.....

..... **[2 marks]**

04.4 Which stain is used to add colour and contrast to plant cells for viewing under the microscope?

Tick **one** box.

Hydrogen peroxide ☐

Iodine solution ☐

Methylene blue ☐

Potassium dichromate ☐ **[1 mark]**

04.5 A micrograph is a photograph taken using a microscope.

Figure 4.2 shows a low-power micrograph of a plant root. The root is approximately 2 mm in diameter just below the meristem.

Figure 4.2

Draw a diagram of the plant root.

Label the meristem on your diagram.

Draw an appropriate scale bar on your diagram.

[4 marks]

04.6 Explain why a plant meristem is described as a zone made up of stem cells.

.....

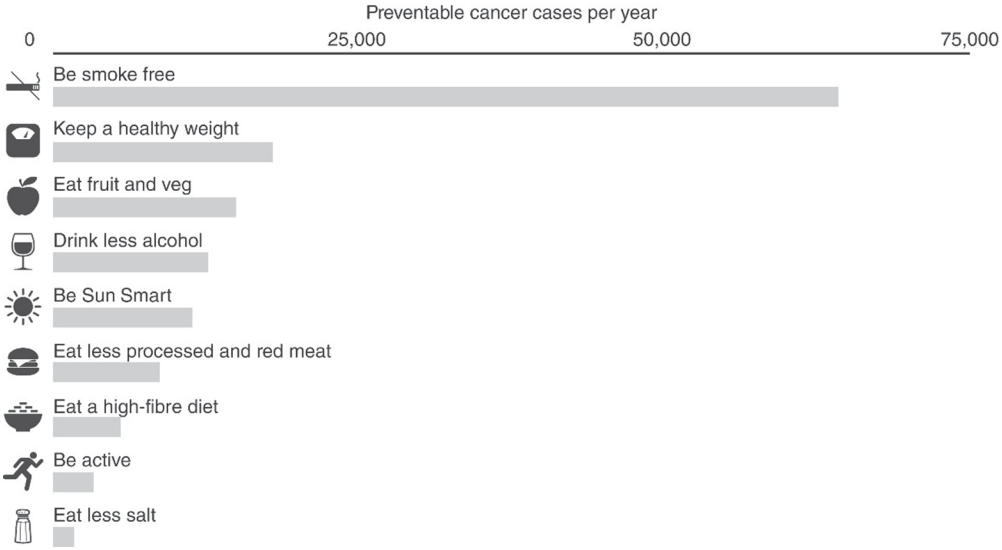
.....

[1 mark]

Turn over >

05 **Figure 5.1** shows the number of preventable cancers, linked to lifestyle choices, in the UK in 2011.

Figure 5.1



05.1 How many preventable cancers were related to smoking?

.....

[1 mark]

05.2 Compare the numbers of preventable cancers related to **being active** with those related to **drinking less alcohol.**

.....

.....

.....

[2 marks]

05.3 Use the data in **Figure 5.1** to describe a healthy diet to reduce the risk of developing cancer.

.....

.....

[2 marks]

05.4 The most common types of cancers are different for men compared with women.

Suggest reasons for this.

.....

.....

.....

.....

[3 marks]

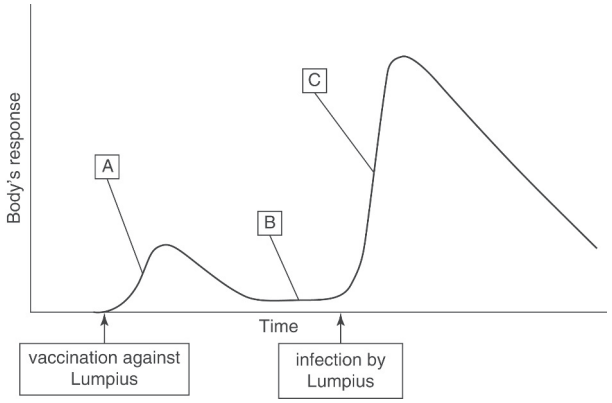
06 A vaccination introduces a small quantity of dead pathogen into the body to protect us from disease.

A new vaccination has been developed against the pathogen Lumpius.

The Lumpius vaccine is being tested by a pharmaceutical company, which has recruited 10 000 volunteers.

Figure 6.1 shows the body's response to the vaccination and later to infection by Lumpius.

Figure 6.1



06.1 Describe what is happening at A.

.....

.....

..... **[2 marks]**

Question 6 continues on the next page

06.2 Describe what is happening at B.

[1 mark]

06.3 Describe what is happening at C.

[3 marks]

06.4 Use **Figure 6.1** to draw conclusions about:

- how effective the vaccine is
- the dose of the vaccine.

[4 marks]

06.5 At what stage of development is the vaccine?

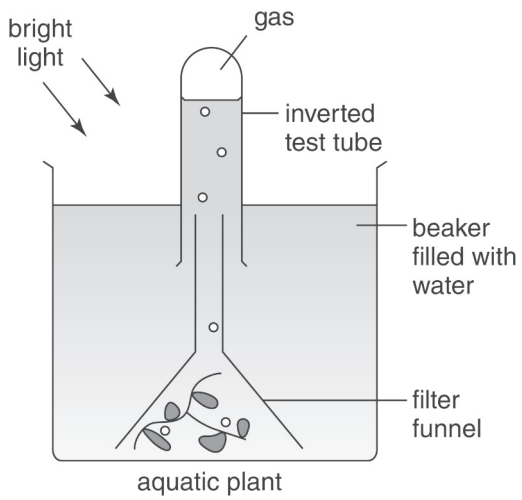
Give a reason for your answer.

[2 marks]

07 Jane has set up equipment to investigate the rate of photosynthesis in an aquatic plant.

She uses a lamp as a light source.

Figure 7.1



07.1 What is the name of the gas collecting in the test tube?

.....

[1 mark]

07.2 Jane uses a lamp as a light source.

Name **two** other pieces of equipment she will need.

.....

.....

[2 marks]

07.3 Explain how Jane should carry out her investigation.

.....

.....

.....

.....

.....

.....

.....

.....

[6 marks]

Question 7 continues on the next page

07.4 What **additional** equipment could Jane use to measure the amount of gas more accurately?

.....

..... **[1 mark]**

07.5 Jane wants a pond in her garden to keep fish.

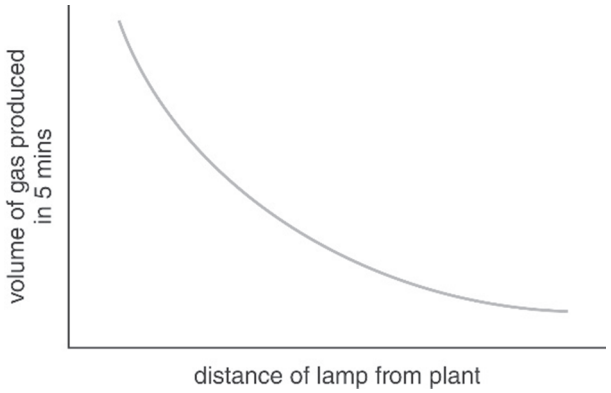
Explain why she should dig her pond in a sunny part of the garden.

.....

..... **[2 marks]**

07.6 **Figure 7.2** shows Jane's results.

Figure 7.2



Explain the shape of the graph.

.....

.....

.....

..... **[3 marks]**

08 During long periods of vigorous activity, insufficient oxygen is supplied to the muscles and anaerobic respiration takes place.

An oxygen debt is created by a build-up of lactic acid.

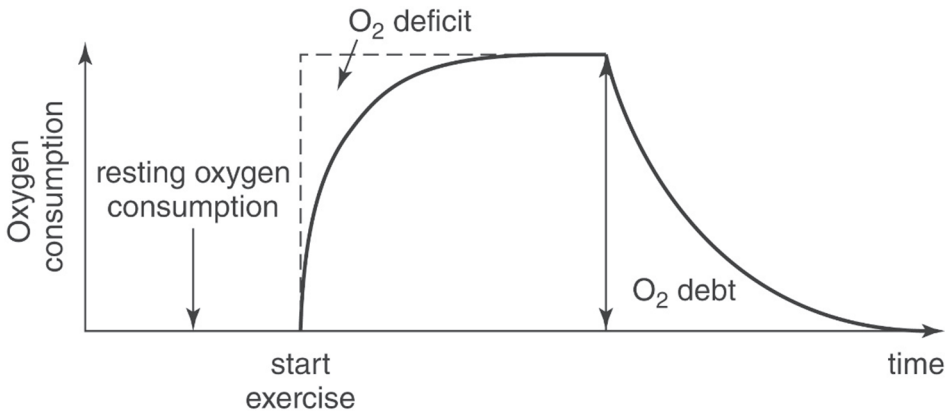
08.1 Why does lactic acid build up in the muscles?

.....

[1 mark]

08.2 **Figure 8.1** shows oxygen consumption over time.

Figure 8.1



Add the following labels to the graph:

A. Excess post-exercise oxygen consumption

B. Steady state oxygen consumption

C. Oxygen requirement

D. Finish exercise

E. Recovery

[5 marks]

08.3 Describe what happens after exercising to the lactic acid that has built up in the muscles.

.....

.....

.....

[2 marks]

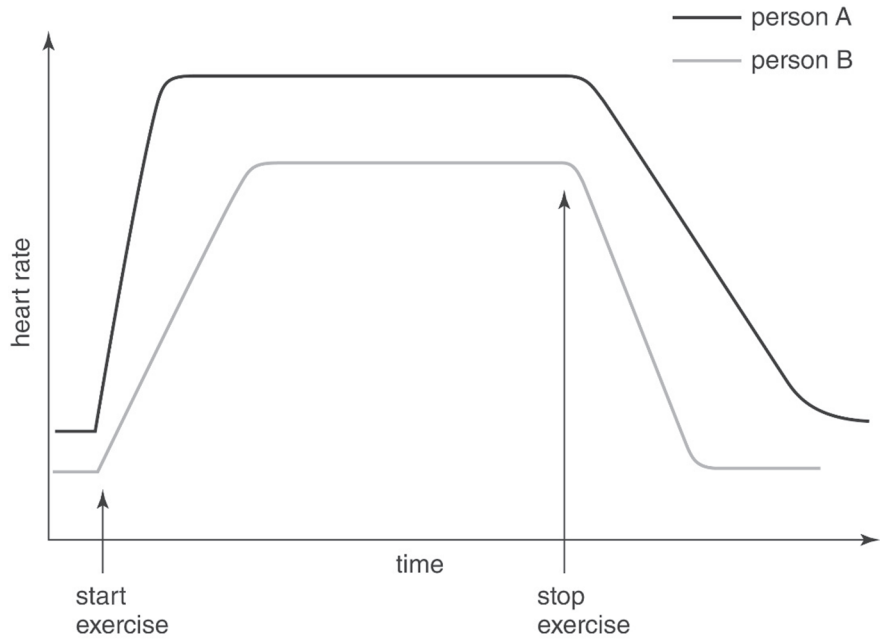
Question 8 continues on the next page

08.4 Describe what is meant by 'oxygen debt', in terms of the amount of oxygen required by the body.

[2 marks]

08.5 **Figure 8.2** shows the effects of exercise on the heart rates of two people.

Figure 8.2



Which person is fitter?

Tick **one** box.

Person A ☐

Person B ☐

[1 mark]

08.6 Give **two** reasons for your answer.

[2 marks]

09 Metabolism is the sum of all the reactions in a cell or organism.

The energy transferred supplies all the energy needed for living processes.

One of these processes is respiration.

09.1 Energy from respiration is used in active transport.

What is active transport?

[2 marks]

09.2 What is another major use of the energy released from respiration?

[1 mark]

09.3 Describe other processes of metabolism.

[6 marks]

10 Stomata are small pores on the surface of plant leaves.

Plants open and close their stomata under different conditions.

10.1 Explain **one** advantage to a plant of closing its stomata.

.....

..... **[2 marks]**

10.2 Explain **one** disadvantage to a plant of closing its stomata.

.....

..... **[2 marks]**

