

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

Level 3 Certificate/Extended Certificate APPLIED SCIENCE

Unit 1 Key Concepts in Science
Section A – Biology

Tuesday 22 January 2019

Morning

Time allowed: 1 hour 30 minutes.
You are advised to spend
approximately 30 minutes on this
section.

Materials

For this paper you must have:

- a calculator
- Formulae sheet.

Instructions

- Use black ink or black ball-point pen.
- Answer **all** questions in each section.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- You will be provided with a copy of the Formulae sheet.
- There are three sections in this paper:
Section A – Biology **Section B** – Chemistry **Section C** – Physics.
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60 and the maximum mark for this section is 20.

Advice

Read each question carefully.

For Examiner's Use	
Question	Mark
1	
2	
3	
TOTAL	



Section A – BiologyAnswer **all** questions in this section.**0 1**

Homeostasis maintains the body's internal environment.

When the body's internal environment changes too much it can cause damage and make people very ill.

0 1 . 1

Homeostasis controls body temperature and blood pH.

What is the normal range for body temperature?

[1 mark]

_____ °C to _____ °C

0 1 . 2

What is the normal range for blood pH?

Tick (✓) **one** box.**[1 mark]**

7.00 – 8.00

7.00 – 7.35

7.35 – 7.45

7.85 – 8.50



0 1 . 3 Hormones are used for negative feedback in homeostasis.

Draw **one** line from each hormone to its function.

[3 marks]

Hormone	Function
ADH (antidiuretic hormone)	controls water retention
Glucagon	converts glucose to glycogen
Insulin	converts glycogen to glucose
	controls heart rate
	controls sodium reabsorption in the kidney

Question 1 continues on the next page

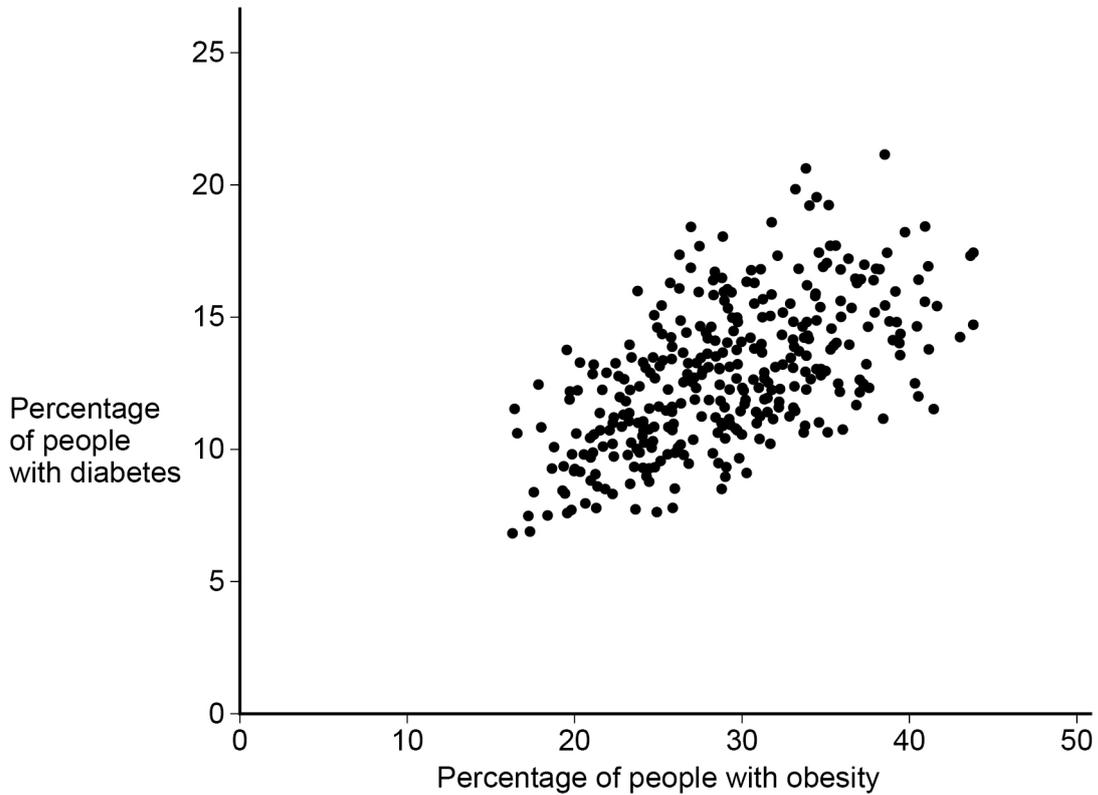
Turn over ►



People with diabetes cannot effectively control the concentration of glucose in their blood.

Figure 1 shows how the percentage of people with diabetes changes as the percentage of people with obesity changes in a population.

Figure 1



0 1 . 4

Give **one** conclusion based on the data in **Figure 1**.

[1 mark]

6

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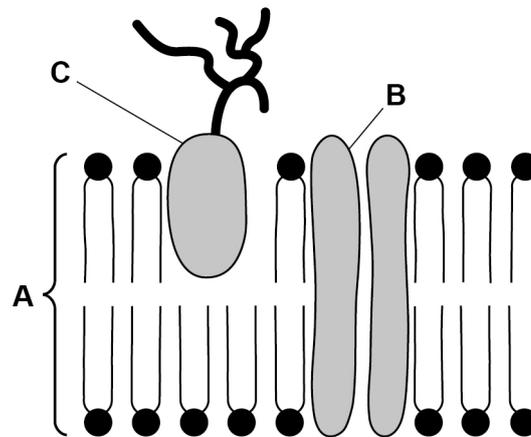


0 2

Cell membranes are partially permeable and control what substances can enter cells.

Figure 2 shows a cell membrane.

Figure 2



0 2 . 1

Name **A** and **B**.

[2 marks]

A _____

B _____

0 2 . 2

What is the function of part **C**?

Tick (✓) **one** box.

[1 mark]

Active transport

Allows oxygen to diffuse through

Cell recognition

Facilitated diffusion

0 2 . 3

Which organelle synthesises phospholipids in eukaryotic cells?

[1 mark]

Question 2 continues on the next page

Turn over ►



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0 2 . 4 When parts of the cell membrane are damaged they are broken down by the cell.

Which organelle breaks down damaged cell parts in eukaryotic cells?

[1 mark]

0 2 . 5 Eukaryotic cells and prokaryotic cells have different characteristics.

Some prokaryotic cells contain plasmids.

Describe the function of plasmids.

[1 mark]

6



0 3

Tomato plants can be grown in greenhouses, either in soil or using hydroponic methods.

Plants grown using hydroponic methods are grown in water with nutrients added.

Table 1 gives information about tomatoes grown in soil and tomatoes grown using hydroponic methods.

Table 1

	Tomatoes grown in soil	Tomatoes grown using hydroponic methods
Number of plants per m ²	1.2	2.4
Annual production in kg per 10 000 m ²	69 700	580 000

0 3 . 1

Table 1 shows that tomatoes grown using hydroponic methods produces a higher yield of tomatoes than those grown in soil.

Suggest **two** reasons why.

[2 marks]

1 _____

2 _____

0 3 . 2

Tomatoes grown using hydroponic methods use a lot more water than tomatoes grown in soil.

Describe what happens to water molecules during the light-dependent stage of photosynthesis.

[2 marks]

Question 3 continues on the next page

Turn over ►



0 3 . 3

Tomatoes are at the start of different food chains.

What name is given to the organism at the start of food chains?

[1 mark]

0 3 . 4

Tomatoes can be eaten as part of a meat-free diet.

Give **two** advantages of eating a meat-free diet.**[2 marks]**1

2

0 3 . 5

Give **one** disadvantage of eating a meat-free diet.**[1 mark]**

8**END OF QUESTIONS**

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ANSWER IN THE SPACES PROVIDED**



