

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

I declare this is my own work.

Level 3 Certificate/Extended Certificate APPLIED SCIENCE

Unit 1 Key Concepts in Science Section A – Biology

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
- the Formulae Sheet (enclosed).

Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- 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	
TOTAL	



Section A – Biology

Answer **all** the questions in this section.

0 1

The internal environment of the human body is maintained within restricted limits.

Hormones are chemicals that help control our internal environment.

0 1 . 1

Draw **one** line from each hormone to the function of that hormone.

[3 marks]

Hormone	Function
	Causes body temperature to increase
Aldosterone	Causes increased production of urine
Glucagon	Causes conversion of glucose to glycogen
Insulin	Causes conversion of glycogen to glucose
	Causes reabsorption of sodium ions in the kidney

0 1 . 2

What effect does an increase in adrenaline have on blood glucose concentration?

[1 mark]

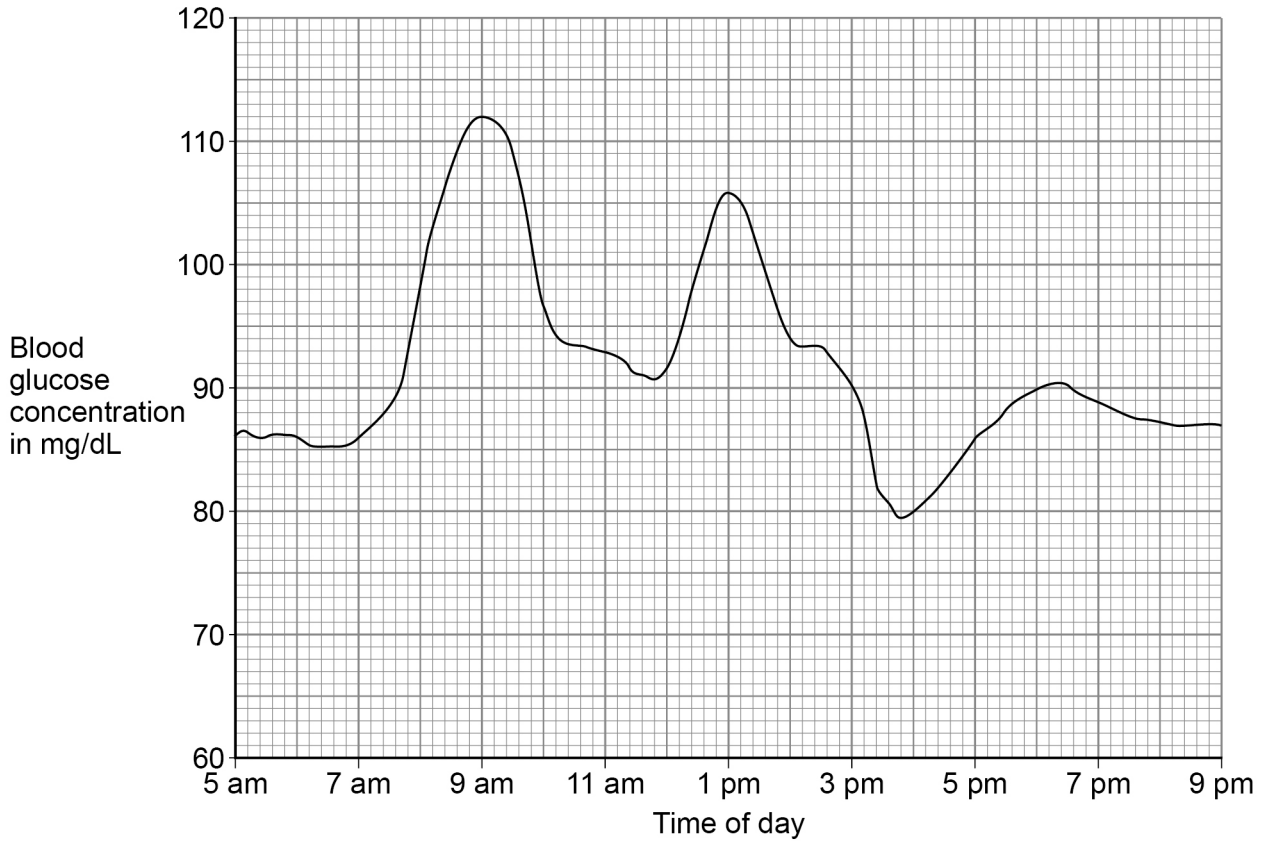


Changes in the internal environment of the human body outside of the restricted limits can indicate poor health.

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outside the
box

Figure 1 shows the blood glucose concentration of a person.

Figure 1



0 1 . 3 The lowest limit of the healthy range for blood glucose concentration is 82 mg/dL.

How long was the person's blood glucose concentration below the normal range?

Use **Figure 1**.

[1 mark]

0 1 . 4 How many times did the person's blood glucose concentration rise above the normal healthy range?

Use **Figure 1**.

[1 mark]

Question 1 continues on the next page

Turn over ►



0 1 . 5 A doctor suspects that another person has Type II diabetes.

The doctor asks for a fasting blood glucose test to be done.

In order for the test to work correctly, the person must **not** eat anything for 8 hours before the blood test.

Why?

[1 mark]

0 1 . 6 Doctors can test a person's urine to check for the presence of glucose.

Describe how the doctor can test the urine to show if there is glucose in the urine.

[2 marks]

0 1 . 7 A doctor decides that another person is at risk of developing Type II diabetes.

Describe **two** ways the person can reduce the risk of developing Type II diabetes.

[2 marks]

1

2



0 2

Cellular respiration is an important process needed for life.

0 2 . 1Which **two** parts of a cell are the sites of ATP production during cellular respiration?**[2 marks]**Tick (✓) **two** boxes.

Cytoplasm

Golgi apparatus

Mitochondria

Nucleus

Rough endoplasmic reticulum

Smooth endoplasmic reticulum

0 2 . 2

Which type of transport in cells uses ATP?

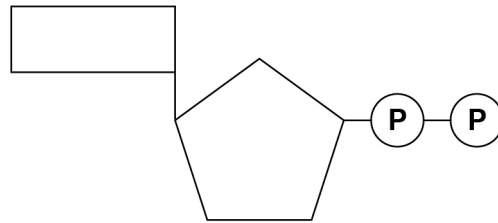
[1 mark]

Question 2 continues on the next page**Turn over ►**

During aerobic respiration ATP is produced using ADP.

Figure 2 shows one molecule of ADP.

Figure 2



0 2 . 3 Complete **Figure 2** to show one molecule of ATP.

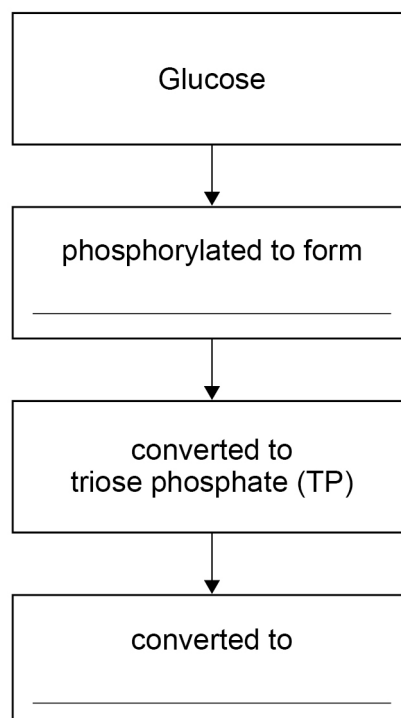
[1 mark]

0 2 . 4 Glycolysis is the first stage of aerobic respiration.

Complete **Figure 3** to show the process of glycolysis.

[2 marks]

Figure 3



0 2 . 5

The electron transfer chain produces most of the ATP that is made during respiration.

NAD and FAD are reduced in the Krebs cycle.

Explain how reduced NAD (NADH) and reduced FAD (FADH₂) are used to produce ATP in the electron transfer chain.

[3 marks]

9

END OF QUESTIONS



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ANSWER IN THE SPACES PROVIDED**



Question number	Additional page, if required. Write the question numbers in the left-hand margin.



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1 2



2 2 1 A A S C 1 / B

IB/M/Jan22/ASC1/B