

A



Surname _____

Forename(s) _____

Centre Number _____

Candidate Number _____

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

ASC1/B

Tuesday 17 January 2023

Morning

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

At the top of the page, write your surname and forename(s), your centre number, your candidate number and add your signature.

[Turn over]



J A N 2 3 A S C 1 B 0 1

MATERIALS

For this paper you must have:

- a calculator
- the Formulae Sheet (enclosed).

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 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.

DO NOT TURN OVER UNTIL TOLD TO DO SO



SECTION A – BIOLOGY

Answer ALL the questions in this section.

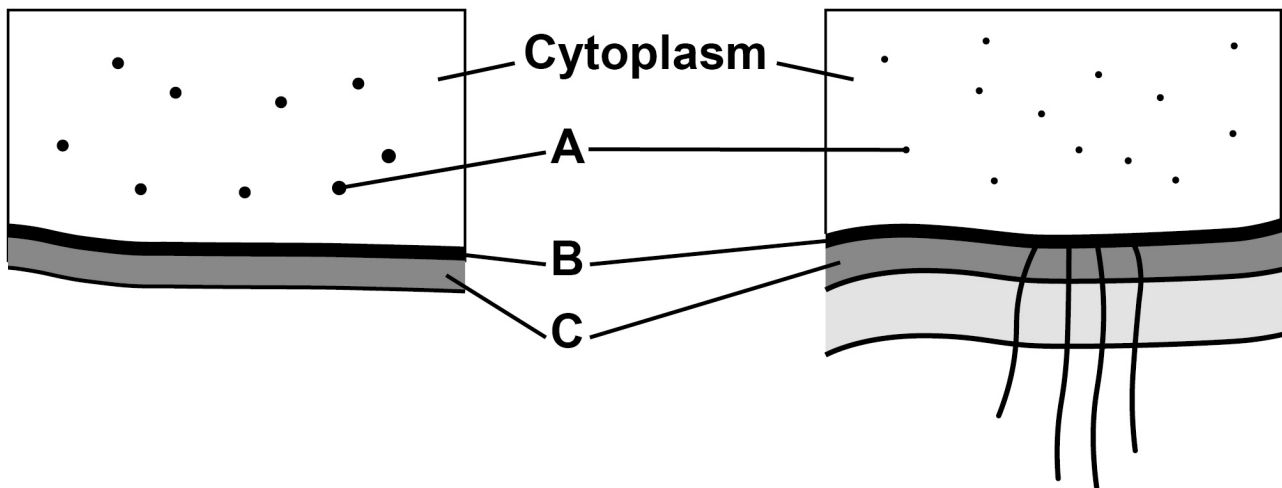
0	1
---	---

All living organisms are made of cells.

FIGURE 1 and FIGURE 2 show part of two different types of cell.

FIGURE 1

FIGURE 2



0	1	.	1
---	---	---	---

The cell in FIGURE 1 is a eukaryotic cell.

Name parts A, B and C in FIGURE 1. [3 marks]

A _____

B _____

C _____



01.2

What type of cell is shown in FIGURE 2? [1 mark]

01.3

What evidence is shown in FIGURE 2 to support your answer to Question 01.2? [2 marks]

[Turn over]

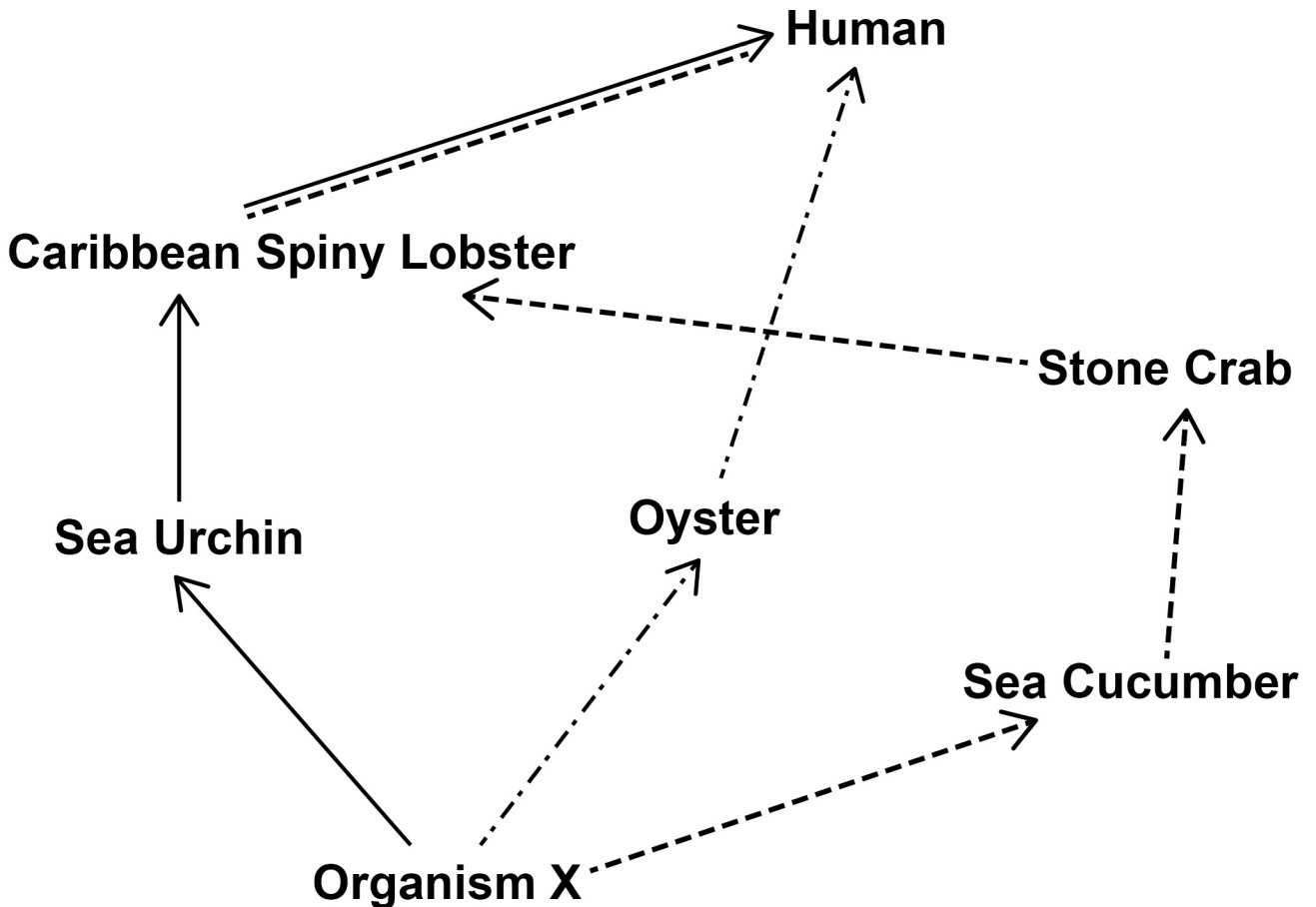
6



02

FIGURE 3 shows part of a marine ecosystem food web.

FIGURE 3



KEY

—————> Food chain 1

- - - - -> Food chain 2

- · - · - ·> Food chain 3

02.1

What type of organism is Organism X? [1 mark]



02.2

Three different food chains are shown in FIGURE 3.

Which is the most efficient food chain for human food production from FIGURE 3?

Give TWO reasons for your answer. [3 marks]

Food chain _____

Reason 1 _____

Reason 2 _____

[Turn over]



02.3

Which factor transfers energy out of food chains and reduces productivity? [1 mark]

Tick (✓) ONE box.

Availability of space

Excretion

Light intensity

Nutrient concentration

02.4

What does 'net primary production (NPP)' mean?
[1 mark]

6



0	3
---	---

One function of the kidneys is to help keep the concentration of water and salts in our blood at the correct level.

The brain monitors the concentration of the blood.

0	3	.	1
---	---	---	---

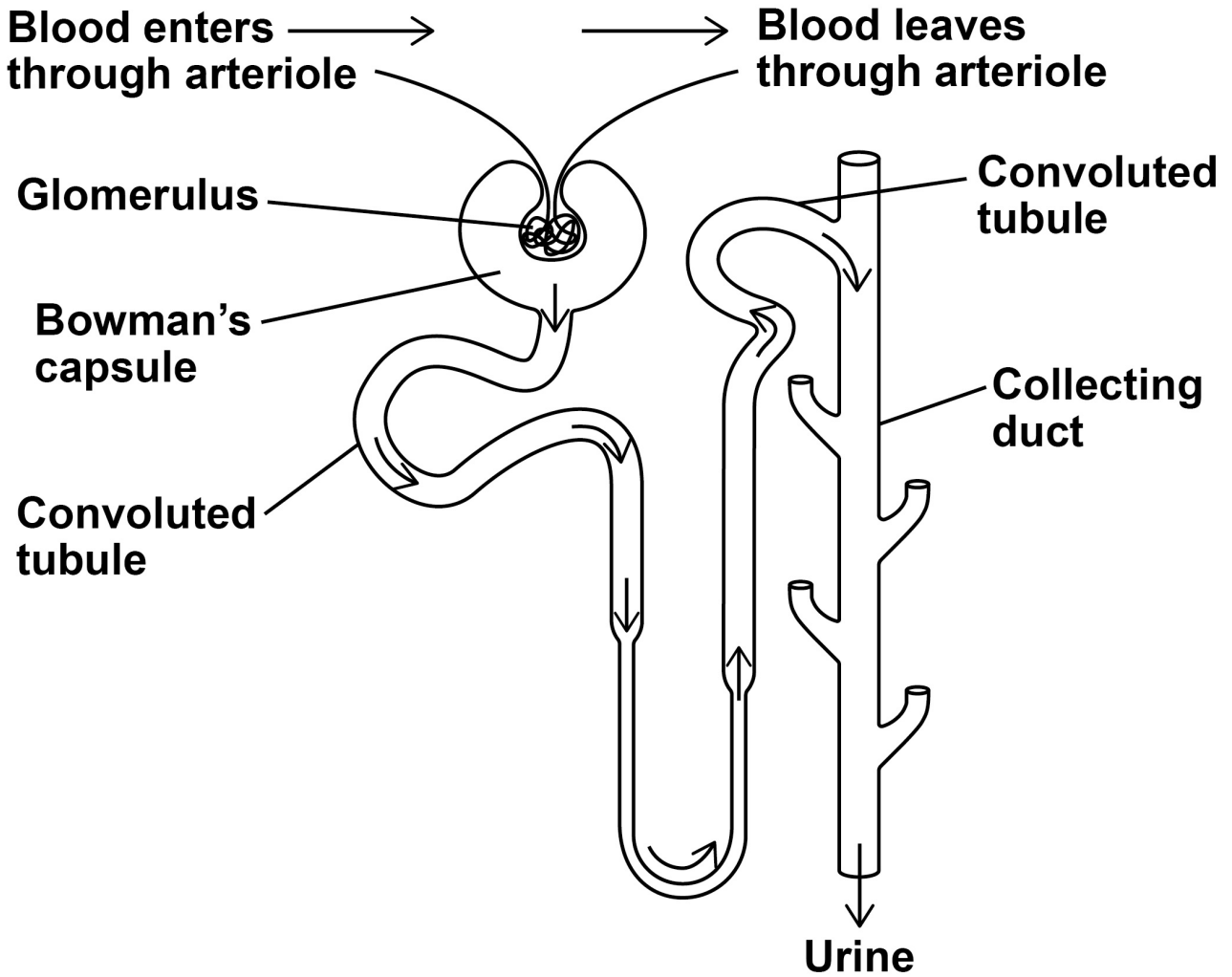
Which part of the brain monitors the concentration of the blood? [1 mark]

[Turn over]



FIGURE 4 shows the structure of a kidney nephron.

FIGURE 4



03.2

Describe the function of the Bowman's capsule and the convoluted tubules. [2 marks]

Bowman's capsule _____

Convoluted tubules _____

[Turn over]



Scientists investigated the concentration of sodium ions in the blood of three athletes during exercise.

Each athlete completed the same exercise.

Each athlete drank a different drink during the exercise.

FIGURE 5, on the opposite page, shows the results.

03.3

Normal sodium ion concentration in the blood is between 135 mmol dm^{-3} and 145 mmol dm^{-3} .

Give TWO conclusions about the effectiveness of the different drinks in maintaining a healthy concentration of sodium ions in the blood. [2 marks]

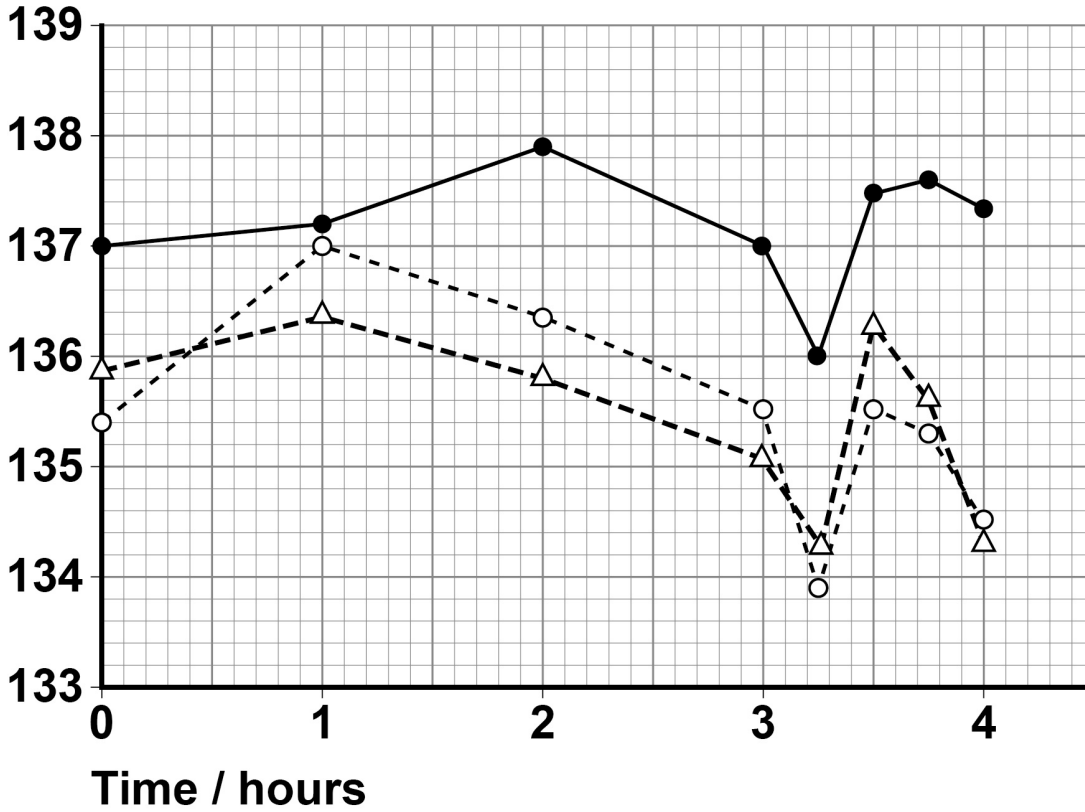
1

2



FIGURE 5

Sodium ion
concentration in
blood / mmol dm^{-3}



KEY

- Athlete 1 – sports drink containing sodium ions
- Athlete 2 – mineral water
- △-- Athlete 3 – distilled water

[Turn over]



BLANK PAGE

For Examiner's Use	
Question	Mark
1	
2	
3	
TOTAL	

Copyright information

For confidentiality purposes, all acknowledgements of third-party copyright material are published in a separate booklet. This booklet is published after each live examination series and is available for free download from www.aqa.org.uk.

Permission to reproduce all copyright material has been applied for. In some cases, efforts to contact copyright-holders may have been unsuccessful and AQA will be happy to rectify any omissions of acknowledgements. If you have any queries please contact the Copyright Team.

Copyright © 2023 AQA and its licensors. All rights reserved.

WP/M/CD/Jan23/ASC1/B/E1