A

Surname _____

Other Names _____

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

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

[Turn over]

JUN22ASC1B01

At the top of page 1, write your surname and other names, your centre number, your candidate number and add your signature.

For this paper you must have:
- **a calculator**
- **the 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 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.

[Turn over]

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

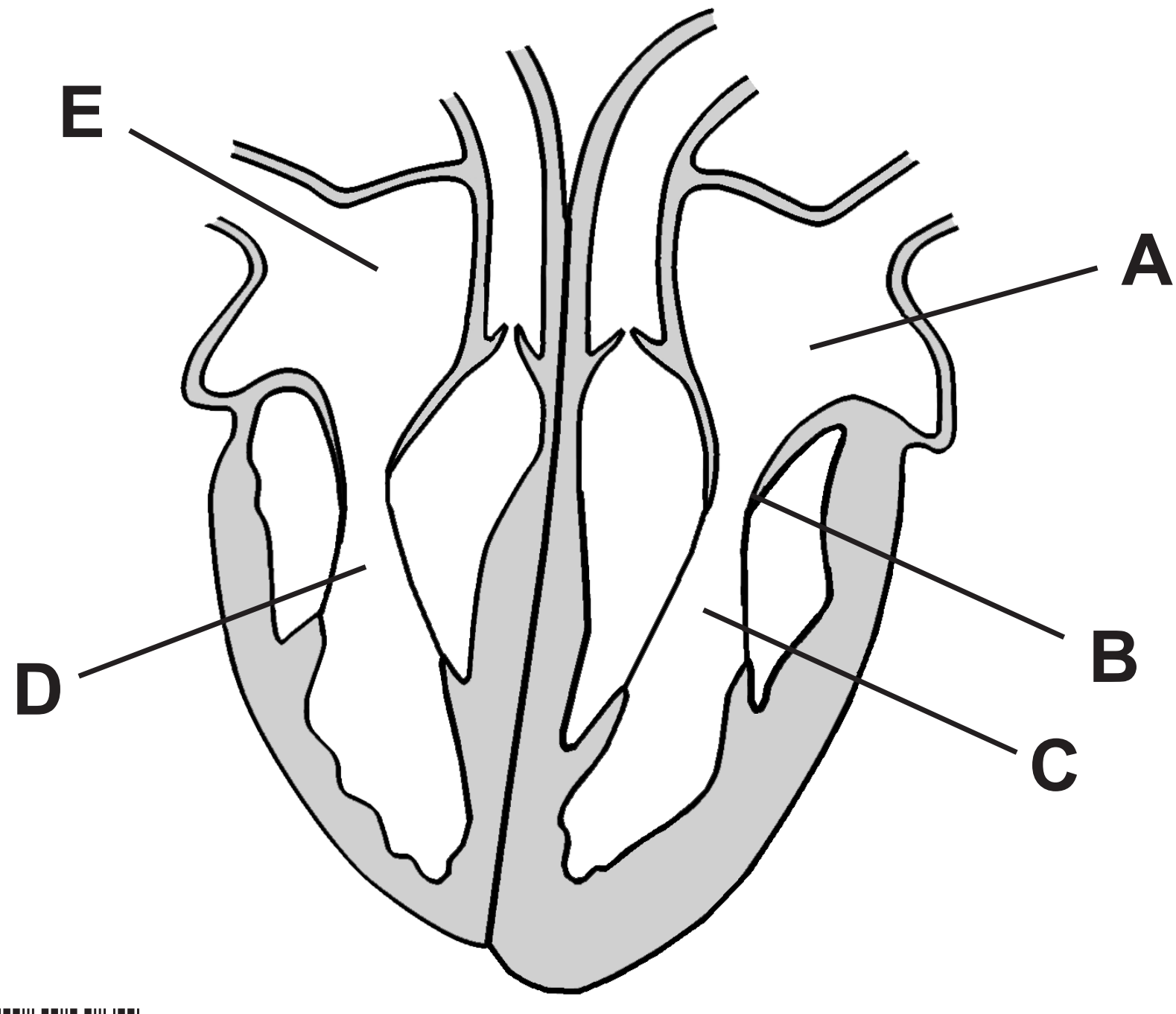
Answer ALL the questions in this section.

0 1

This question is about the heart.

FIGURE 1 shows the structure of the heart.

FIGURE 1



0 1 . 1

Which part of the heart is the left ventricle? [1 mark]

Tick (✓) ONE box.

- ☐ **A**
- ☐ **B**
- ☐ **C**
- ☐ **D**
- ☐ **E**

[Turn over]

0 1 . 2

Which part of the heart is the bicuspid valve? [1 mark]

Tick (✓) ONE box.

- ☐ **A**
- ☐ **B**
- ☐ **C**
- ☐ **D**
- ☐ **E**

0 1 . 3

Define the term ARRHYTHMIA.
[1 mark]

0 1 . 4

Some people have an artificial pacemaker fitted.

Explain how an artificial pacemaker controls heart rate. [3 marks]

0 1 . 5

During each heart beat the pressure in the blood vessels increases.

If blood pressure becomes too high the resting heart rate decreases.

Describe how the increase in blood pressure is detected by the body.
[2 marks]

8

0 2

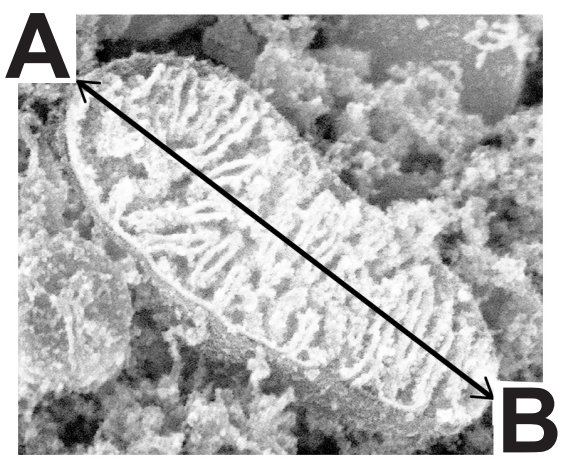
Most eukaryotic cells have mitochondria.

0 2 . 1

Give ONE other structure found in eukaryotic cells that is NOT found in prokaryotic cells. [1 mark]

FIGURE 2 shows a mitochondrion seen through an electron microscope.

FIGURE 2



0 2 . 2

Line A–B in FIGURE 2 shows the length of the mitochondrion.

The magnification of the image is 73 000

Calculate the actual size of the mitochondria in FIGURE 2 in micrometres (μm).

Use the equation:

$$\text{actual size} = \frac{\text{observed size}}{\text{magnification}}$$

[2 marks]

Actual size of mitochondria = _____ μm

[Turn over]

0 2 . 3

All cells need energy from respiration.

There are different stages in respiration.

Where in a cell do the electron transfer chain and glycolysis take place?

Complete TABLE 1 opposite. [2 marks]

TABLE 1

Stage of respiration	Where in a cell the stage takes place?
Electron transfer chain	
Glycolysis	

5

[Turn over]

0 3

Photosynthesis is a process that occurs in plants.

A student investigated the effect of light on photosynthesis in plant leaves.

This is the method used.

1 Cut 10 small disks from a leaf.

2 Place the leaf disks in a beaker of sodium hydrogen carbonate solution.

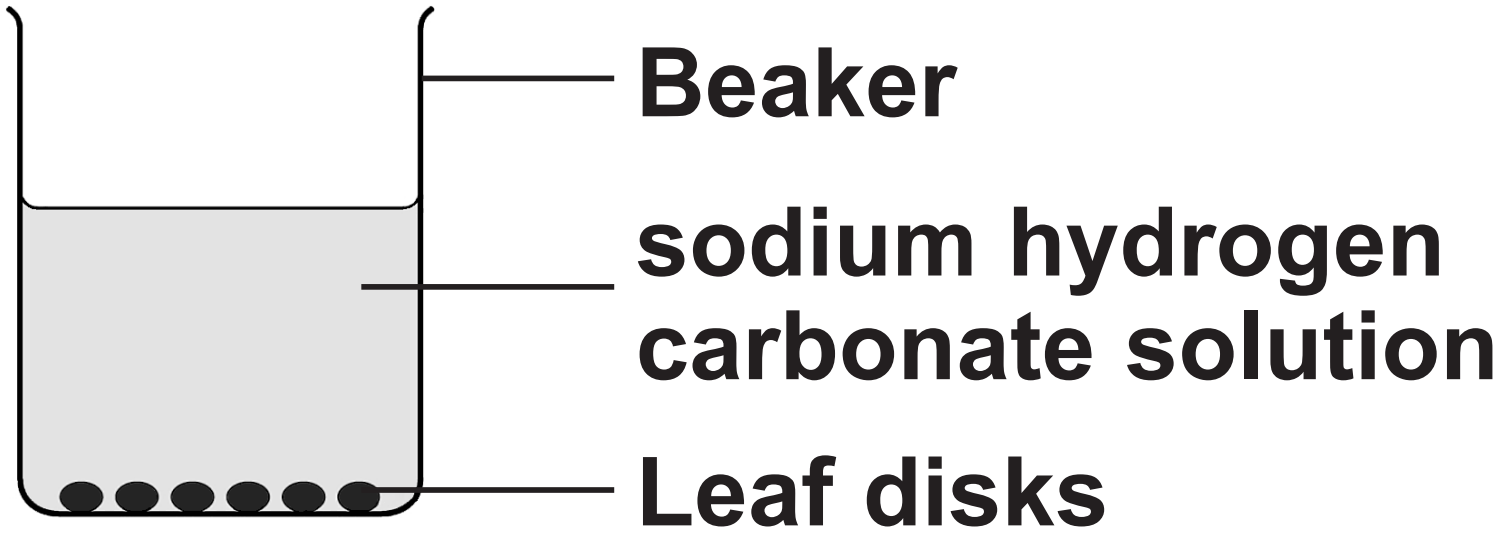
3 Wait until all the leaf disks fall to the bottom of the beaker.

4 Shine a bright light onto the beaker.

The student repeated the experiment in very dim light.

FIGURE 3 shows the student's experiment.

FIGURE 3



0 3 . 1

Name the essential raw materials needed for photosynthesis. [1 mark]

0 3 . 2

When a light shines onto the leaf disks, they float to the surface of the solution.

Explain why the leaf disks float when light is shining onto them. [3 marks]

BLANK PAGE

[Turn over]

0 3 . 3

When the experiment was done in very dim light, the leaf disks did not float. The leaves were ONLY carrying out the light-independent stage of photosynthesis.

Describe what happens during the light-independent stage of photosynthesis. [3 marks]

7

END OF QUESTIONS

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

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

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For Examiner's Use	
Question	Mark
1	
2	
3	
TOTAL	