GCSE

ADDITIONAL SCIENCE B

Additional Science B Unit 1 Modules B3, C3, P3

F

B623/01

Specimen Paper

60 mins

Candidates answer on the question paper:
Additional materials: ruler (cm/mm), calculator

Candidate Name	

Centre Number						Candidate Number				

TIME 60 mins

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above.
- Answer **all** the questions.
- Write your answers on the dotted lines unless the question says otherwise.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- There is a space after most questions. Use it to do your working. In many questions marks will be given for a correct method even if the answer is incorrect.
- Do not write in the bar code. Do not write in the grey area between the pages.
- DO NOT WRITE IN THE AREA OUTSIDE THE BOX BORDERING EACH PAGE. ANY WRITING IN THIS AREA WILL NOT BE MARKED.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [ ] at the end of each question or part question.
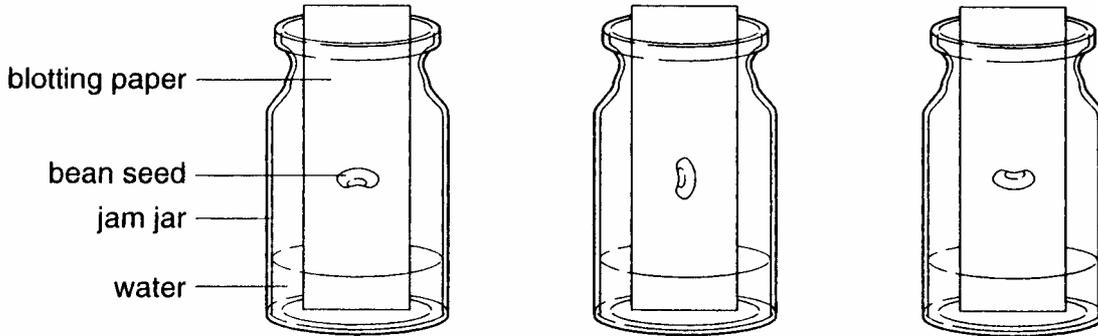- The total number of marks for this paper is **60.**

This specimen paper consists of 25 printed pages.

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Answer all questions.

Section 1

1. **(a)** Janet's class is investigating the directions that roots and shoots grow. They grow bean seeds in jam jars.

They put the beans in different positions.

They let them grow on a window sill for a few days. These are their results.
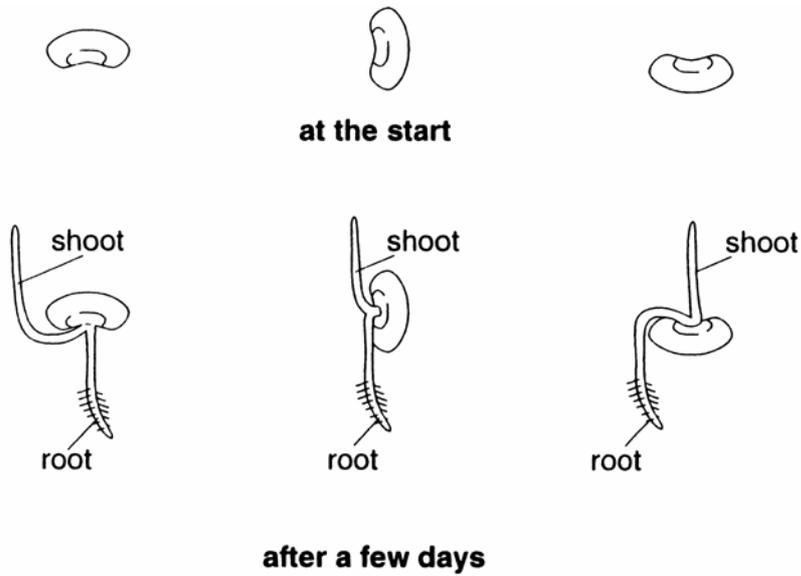
Describe these results.

Explain why the shoots and roots grow in these directions.

Shoots ....

....

Roots ....[4]

(b) Many of the tomatoes we eat are imported from other countries.

They are often picked while they are still green and unripe.

Later they are ripened before they are sold.

(i) Suggest why tomatoes are transported while they are unripe.

....

....[1]

(ii) How can tomatoes be ripened quickly before they are sold?

....

....[1]

[Total: 6]

2. The diagram shows a human heart.
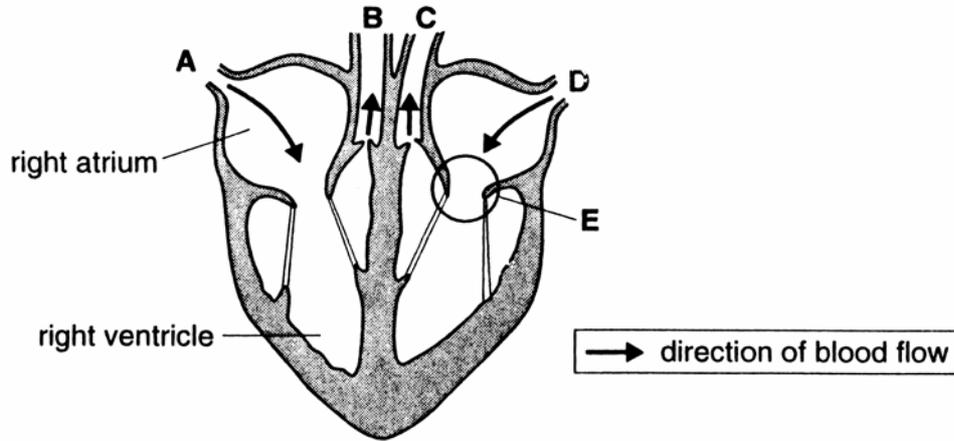
(a) Describe the main job of the heart.

....[1]

(b) It is important that part **E** works properly.

Explain what will happen if it does **not** work properly.

....

....[2]

(c) Which blood vessels are arteries? Choose from **A, B, C** or **D**.

....[1]

(d) **(i)** Blood vessels carry blood round the body.

Write down the name of a blood vessel that transports blood away from the heart.

....[1]

(ii) Some blood vessels allow materials to move in and out of the blood.

Write down the name of the blood vessels that exchange materials with the tissues.

....[1]

[Total: 6]

3. Amy uses a microscope to look at some muscle cells.

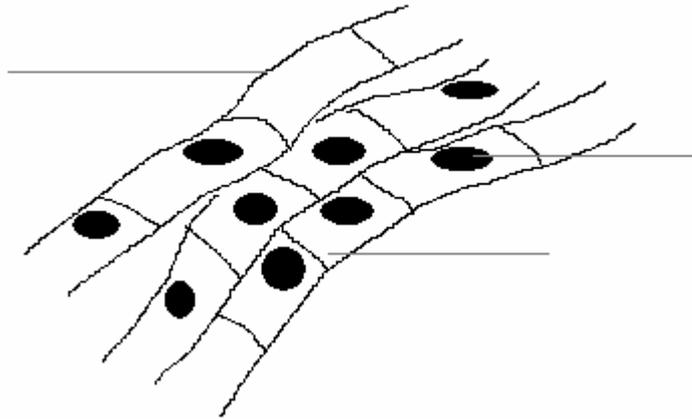Amy draws a diagram of what she can see.

(a) Label the diagram.

Choose the best words from this list.

<div align="center">

cell membrane

cell wall

cytoplasm

nucleus

</div>

[3]

(b) Finish the table by writing in the name of the cell part next to the job it does.

Job	Name of cell part
Controls what the cell does and contains genetic information	
Controls the movement of substances in and out of the cell	
The place where chemical reactions take place; contains enzymes to speed up these reactions	

[3]

(c) Give two reasons why muscle cells need protein.

....

....[2]

[Total: 8]

Section 2

4. This question is about the Periodic Table.

Use the Periodic Table found on the back page to help you answer these questions.

(a) How many elements are there in the Periodic Table?

Tick your answer.

number of elements in the Periodic Table	tick one box only
less than 50	
about 50	
just over 100	
over 1000	

[1]

(b) Find calcium, Ca, on the Periodic Table.

What is the **atomic number** of calcium?

....[1]

(c) Find oxygen, O, on the Periodic Table.

Write down the name of an element in the same **group** as oxygen.

....[1]

(d) Find carbon, C, on the Periodic Table.

Write down the name of an element in the same **period** as carbon.

....[1]

(e) Write down the name of a transition element.

....[1]

(f) Calcium, Ca, reacts with oxygen, O_2, to make calcium oxide, CaO.

Write a **balanced symbol equation** for this reaction.

....[2]

[Total:7]

5. This question is about the Group 1 metals.

Sodium and potassium are Group 1 metals.

(a) Write down the name of one other Group 1 metal.
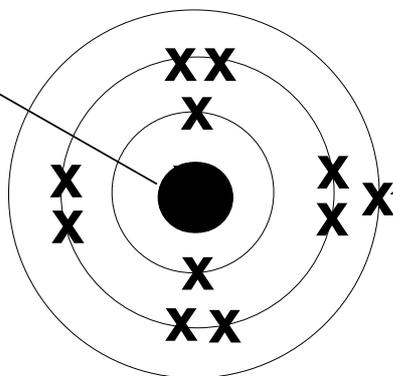
Use the Periodic Table to help you.

....[1]

(b) Sodium and potassium are stored under oil.

Explain why.

....

....[2]

(c) Look at the diagram of a sodium atom.

part **A**

electron

(i) What is the name of part **A**?

....[1]

(ii) What is the charge on an electron?
Choose from:

negative

neutral

positive

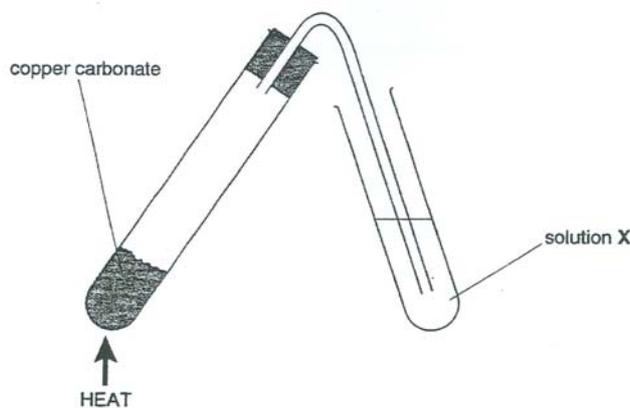..[1]

[Total: 5]

6. Jamie and Gulam heat copper carbonate.

Look at the diagram. It shows the apparatus they use.

They use solution **X** to test for carbon dioxide.

(a) **(i)** Write down the name of solution **X.**

....[1]

(ii) What happens to solution X as carbon dioxide is bubbled through it?

....[1]

(b) The word equation for the action of heat on copper carbonate is

copper carbonate $\longrightarrow$ copper oxide + carbon dioxide.

This is an example of **thermal decomposition**.

What does thermal decomposition mean?

....[2]

[Total: 4]

7. Nikita and Matthew do some flame tests.

They test the chemicals in three bottles.

One bottle contains sodium chloride, another potassium chloride and a third lithium chloride.

The names are missing from the bottles.

Nikita and Matthew are asked to find out which chemical each bottle contains

Describe how they do a flame test.

You should include

- what they do

- the results they would get for each chemical.

You may wish to draw a diagram to help your answer.

....

....

....

....

....[4]

[Total: 4]

Section 3

8. (a) Helen investigates the speeds of cars outside her school.

What two **measurements** does she take?

1st measurement ....

2nd measurement ....[2]

(b) Helen watches racing cars.

Five cars are in a race. The race is 2 laps of the track.

Helen investigates their average speeds for each lap. She measures the times for each lap.

Look at her table of results.

car	1st lap time in seconds	2nd lap time in seconds	total time in seconds
BMW	50	70	120
Citroen	50	50	100
Fiat	60	60	120
Ford	50	40	90
Rover	40	100	140

(i) Which car **wins** the race?

Choose from:

BMW   **Citroen**   **Fiat**   **Ford**   **Rover**

....[1]

(ii) Which **two** cars race at **steady** average speeds?

Choose from:

BMW **Citroen** **Fiat** **Ford** **Rover**

....[1]

(iii) Which **two** cars complete the second lap **slower** than the first lap?

Choose from:

BMW **Citroen** **Fiat** **Ford** **Rover**

....[1]

(iv) Which car completes the second lap **faster** than the first lap?

Choose from:

BMW **Citroen** **Fiat** **Ford** **Rover**

....[1]

(c) Look at the information about stopping distances for a car.

Speed of car in m/s	Thinking distance in m	Braking distance in m	Stopping distance in m
10	5	5	10
20	10	20	30
40	20	80	100

(i) What do we **mean** by **thinking** distance?

....

....[2]

(ii) Higher speed makes the **braking distance** longer.

Write down 2 **other** factors that make the braking distance longer.

1st factor ....

2nd factor ....[2]

(iii) How can you calculate stopping distance?

....[1]

[Total: 11]

9. Cars have **safety features**.

These safety features help reduce injuries in a crash.

(a) One safety feature in cars is **crumple zones**.

Look at the diagram.

Rear crumple zone   Front crumple zone
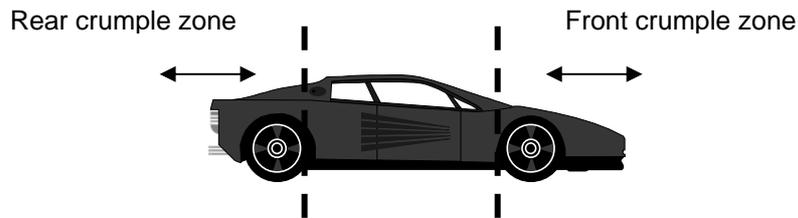
How do crumple zones help reduce injuries in a crash?

....

....[1]

(b) Another safety feature in cars is **safety belts**.

After a crash the car needs to be repaired. What should happen to safety belts **after** a crash?

....[1]

(c) Name one **other** safety feature in cars.

....[1]

[Total: 3]

10. Look at the diagram.
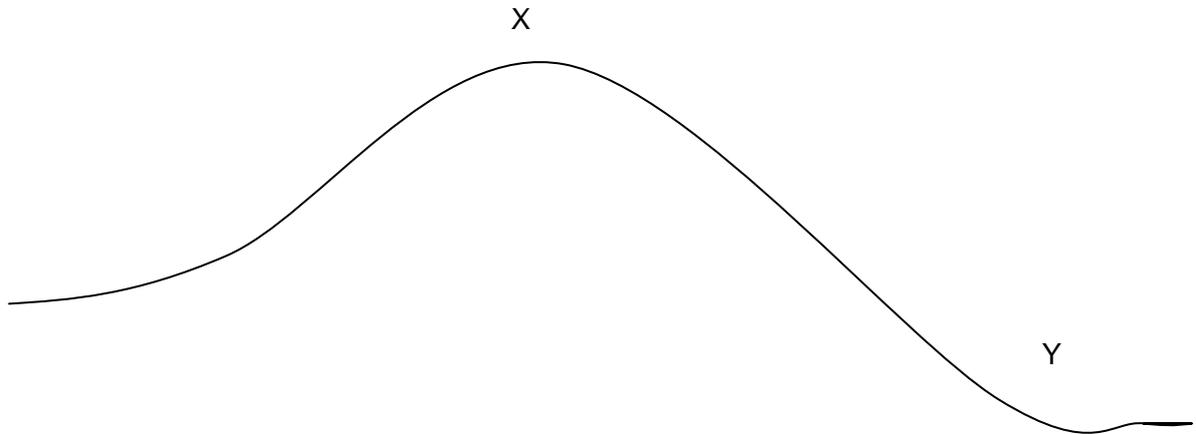
A ball is lifted to position X.

The height of the lift is 20m. The force used is 10 000N.

(a) **(i)** Calculate the work done on the ball when it is lifted to position X.

....

....

answer...J [3]

(ii) The ball is at position X. It is still.

What type of energy does the ball have at position X?

....[1]

(b) **(i)** The ball starts to roll down the hill. It passes part **Y**.

This is the **fastest** part of the journey.

What type of energy does the ball have at position **Y**?

....[1]

(ii) Suggest why point **Y** is the **fastest** part of the journey.

In your answer use the idea of energy.

....

....[1]

[Total: 6]

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GCSE

ADDITIONAL SCIENCE B

Additional Science B Unit 1 Modules B3, C3, P3

Specimen Mark Scheme

Maximum mark for this paper is 60

F **B623/01**

60 mins

Question Number	Answer	Max Mark
1(a)	**Max two marks for shoots** (shoots) grow upwards/towards the light/(positive) phototropism; **Max two marks for roots** (roots) grow downwards/towards the effects of gravity/(positive) geotropism; **(Allow higher level answers about auxin distribution and cell elongation)**	**[4]**
1(b)i	**Any one** Prevent damage/last longer/delay aging/delay decay **(Allow easier to pick when unripe so less damage caused before storage)**;	**[1]**
1(b)ii	By using plant hormones;	**[1]**
	Total marks	**[6]**
2(a)	Pumps/contracts/pushes blood;	**[1]**
2(b)	**Any two** If faulty then the following cannot be achieved: opening and closing of valve; prevention of back flow of blood; maintenance of high pressure;	
2(c)	B and C **(Both required for one mark)**	**[2]**
2(d)i	**Any one** pulmonary artery/aorta;	**[1]** **[1]**
2(d)ii	Capillary/capillaries;	**[1]**
	Total marks	**[6]**
3(a)	correct labelling of cell membrane, nucleus, cytoplasm.	**[3]**
3(b)	nucleus; cell membrane; cytoplasm.	**[3]**
3(c)i	growth / repair	**[2]**
	Total marks	**[8]**

Section 2		
4(a)	just over 100	**[1]**
4(b)	20	**[1]**
4(c)	sulphur/ selenium/ tellurium/ polonium **(accept correct symbols)**	**[1]**
4(d)	lithium/ beryllium/ boron/ nitrogen/oxygen/ fluorine/neon **(accept correct symbols)**	**[1]**
		[1]
4(e)	any correct transition element **(accept correct symbols)**	
4(f)	$2Ca + O_2 \rightarrow 2CaO$	
	formulae (1)	**[2]**
	balancing (1) **(accept multiples)**	
	Total marks	**[7]**

5(a)	lithium/ rubidium/ caesium/ francium; (accept correct formula)	**[1]**
5(b)	**Any two from**	
	very reactive (1);	
	reacts with air/ oxygen (1);	
	reacts with water (1);	**[2]**
5(c)i	Nucleus **(not proton or neutron)**;	**[1]**
5(c)ii	Negative;	**[1]**
	Total marks	**[5]**

6(a)i	Limewater **(accept calcium hydroxide or bicarbonate indicator)**;	**[1]**
6(a)ii	turns cloudy/ milky/ white/ forms white solid/ precipitate;	**[1]**
6(b)	break down (1);	
	by heating (1);	**[2]**
	Total marks	**[4]**

7	**At least one from:**	
	(Flame) test wire / splint / rod / spatula moistened with HCl(aq) or water / AW (1)	
	(Flame) test wire / splint / rod / spatula dipped in substance (1)	
	Substance put into the Bunsen flame using an appropriate method (1)	
	At least one from:	
	Sodium (chloride) – orange / yellow flame (1)	
	Lithium (chloride) – red / crimson flame (1)	
	Potassium (chloride) - pink/ lilac/ mauve / purple / violet flame (1)	**[4]**
	Total marks	**[20]**

Section 3		
8(a)	Distance (1); **(accept length)** Time (1);	
8(b)i	Ford (1);	**[2]**
8(b)ii	Citroen and Fiat (1) **(both needed)**;	**[1]**
8(b)iii	BMW and Rover (1) **(both needed)**;	**[1]**
8(b)iv	Ford (1);	**[1]**
8(c)i	Idea of **distance** (1); (not time/how long) (car moves) while driver reacts / AW (1);	**[1]** **[2]**
8(c)ii	Any **one** road condition from: Icy / wet / muddy / oily road / AW; **(Accept slippy road (1))**; Any **one** car condition from: Worn tyres / worn brakes / AW; **(Accept poor suspension / greater load / AW (1))**;	**[2]**
8(c)iii	The idea of: Thinking distance+braking distance / AW (1);	**[1]**
	Total marks	**[11]**
9(a)	**Any one from:** Absorb energy; Accept also higher level answers such as: Less acceleration; so less force (needed); Longer stopping time; longer stopping distance;	
9(b)	Seatbelts need replacing;	**[1]**
9(c)	Any reasonable safety feature: Safety cage / air bags / side impact bars / ABS breaks / traction control (1) **(not crumple zones/safety belts)**;	**[1]** **[1]**
	Total marks	**[3]**
10(a)i	W = F X D; W = 10 000 X 20; W = 200 000 (J);	**[3]**
10(a)ii	Potential energy/PE (accept gravitational);	**[1]**
10(b)i	Kinetic/KE/movement;	**[1]**
10(b)ii	At Y – Most KE / Least PE / all PE is converted / AW;	**[1]**
	Total marks	**[6]**
	Overall total	**[60]**