

NAME:	SCIENCE TEACHER	9C
Form Class		

SCIENCE

Year 9 Examination 2008

9C – 40 marks

Make sure that you have answered all the questions in paper 9B before you start this paper

Time allowed for both examinations: 2 hours

Answer all questions in the spaces provided on the paper.

You may use a calculator.

Show all your working in calculations; marks are awarded for it.

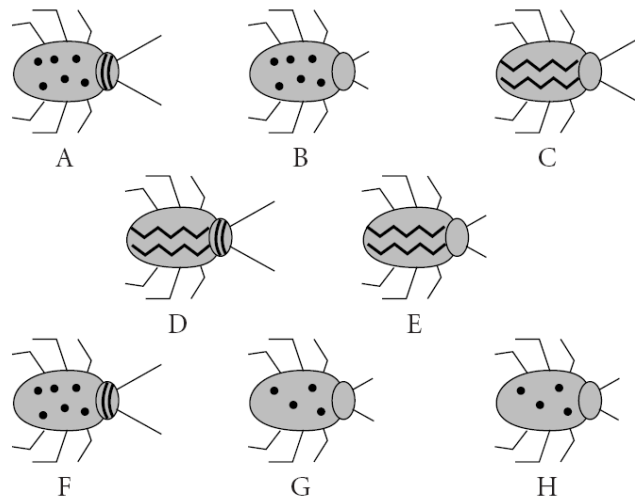
Give units for all answers (eg kg or m) unless they are already provided.

For Teacher Use

Question	1	2	3	4	5	6	7	8	9	10	11	Total
Marks gained												
Marks available	4	4	3	3	5	4	3	4	4	4	2	40

Question One: CLASSIFICATION [4 marks]

The NZ Entomological Society studies insects. Here is a group of new insects they found on an expedition to Greenland.



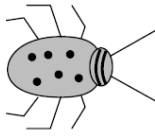
- (a) Put these insects into TWO groups by looking at the pattern on their back.

Feature	spots on their backs	zigzag lines on their backs
Members of the group		

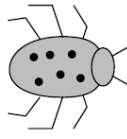
- (b) Choose another feature that differs between the insects. Put the insects into groups according to that feature

Feature		
Members of the group		

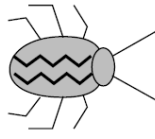
(c) Complete this CLASSIFICATION KEY to identify insects A – E.



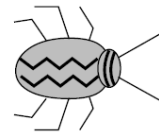
A



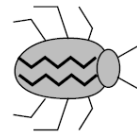
B



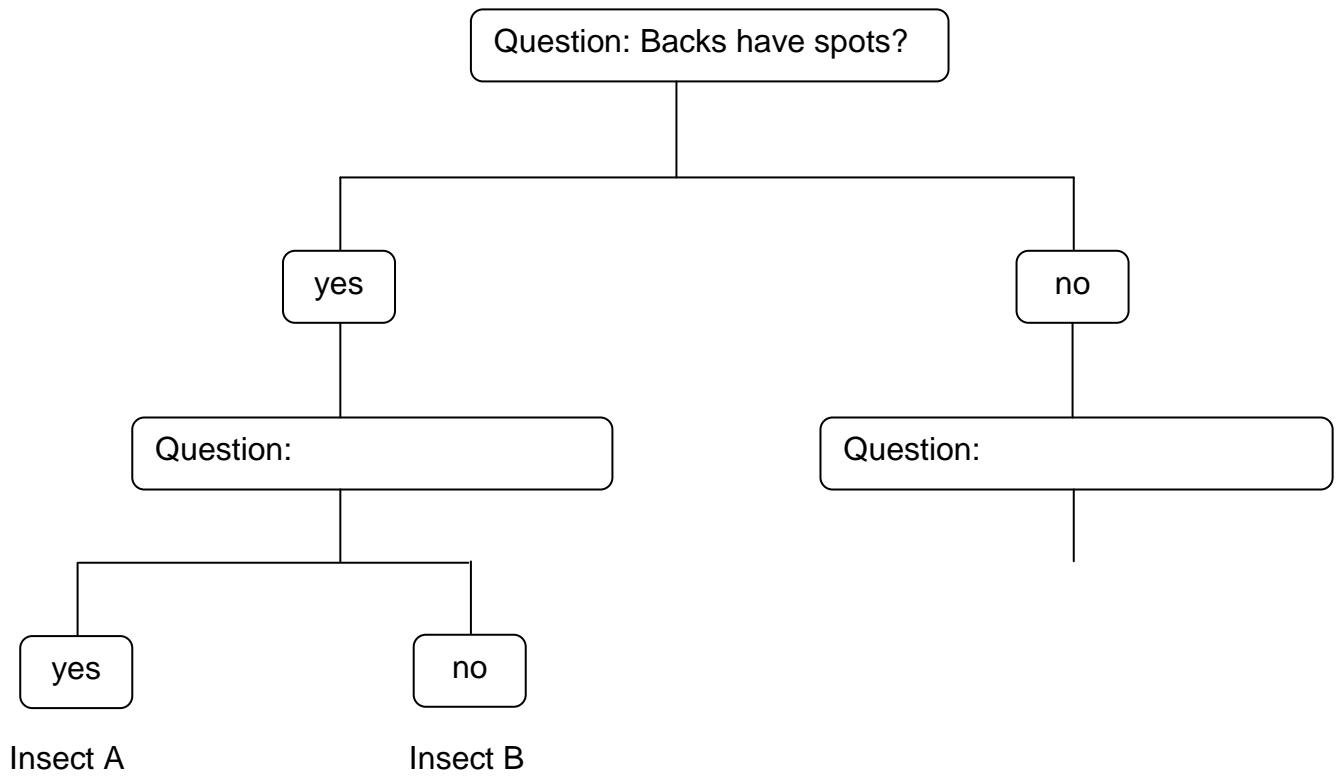
C



D

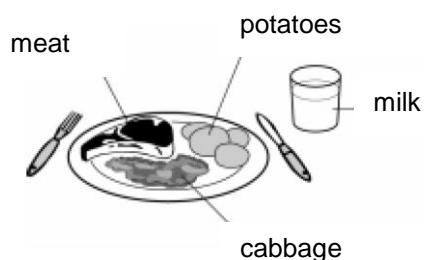


E



Question Two: FOOD [4 marks]

A meal should contain foods that provide the important nutrients. A meal is shown below.



- (a) Match the names of the food above to the important nutrients they provide. Use each food only once.

Name of the food	Nutrient
	carbohydrate
	protein
	vitamin C
	calcium

The table shows the mass of carbohydrate, fat and protein in five different foods, **A** to **E**.

Food	Mass in 100 g of food in g		
	Carbohydrate	Fat	protein
A	0	1	20
B	50	10	6
C	0	42	0
D	12	1	0
E	20	0	2

- (b) Calculate the mass of carbohydrate in a **40 g** portion of food **E**. Show your working.

Mass = _____ ()units

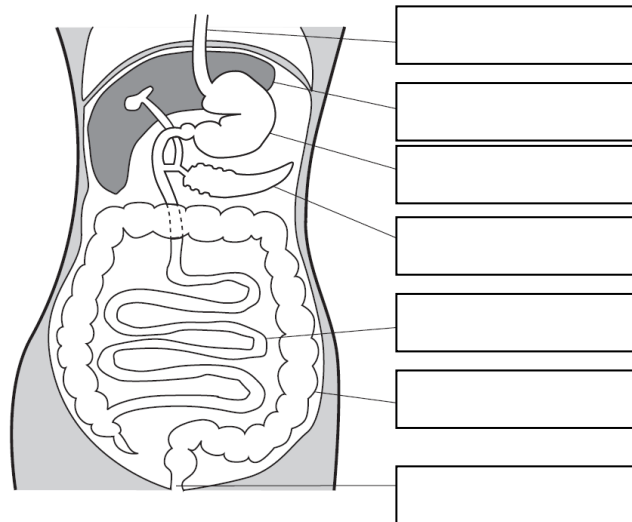
- (c) Carbohydrates and proteins release about the same amount of energy in the body. Fats release about twice as much energy as carbohydrates and proteins.

Which food, **B** or **C**, releases most energy in the body? Explain how you chose your answer.

Food _____

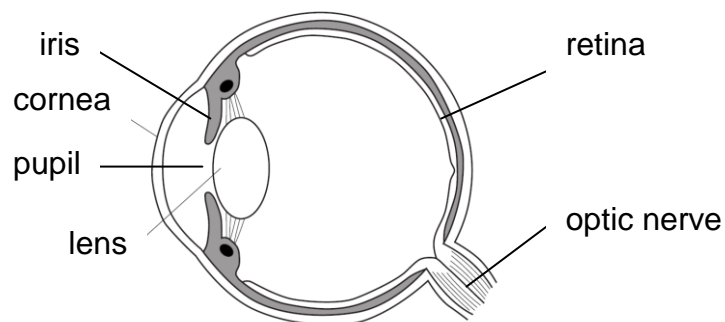
- (d) Label this diagram using the words provided.

anus large intestine liver oesophagus pancreas small intestine stomach



Question Three: THE EYE [3 marks]

The diagram shows a section through the eye.



- (a) What happens to the pupil in bright light and why?

- (b) Cataracts make the lens become cloudy. Explain why this makes it difficult to see.

- (c) A person's optic nerve is cut in an accident. Other parts of the eye are undamaged. Explain why the person would/would not be able to see with that eye .

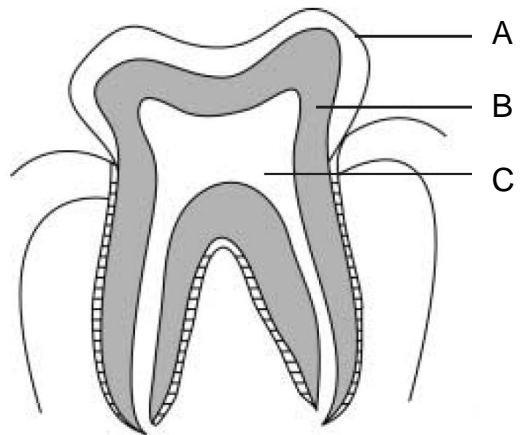
The person **would / would not** be able to see with that eye because...

Question Four: TEETH [3 marks]

The diagram shows a vertical section of a human molar tooth.

- (a) Match **one** of the letters, **A**, **B** or **C**, from the diagram with each description.

contains nerves & blood vessels	contains enamel

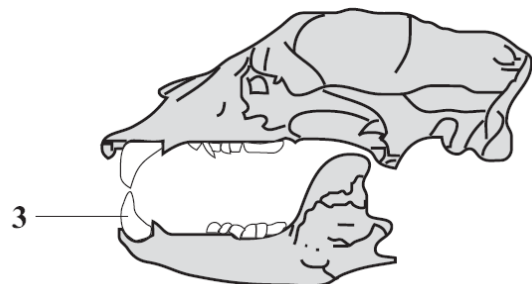
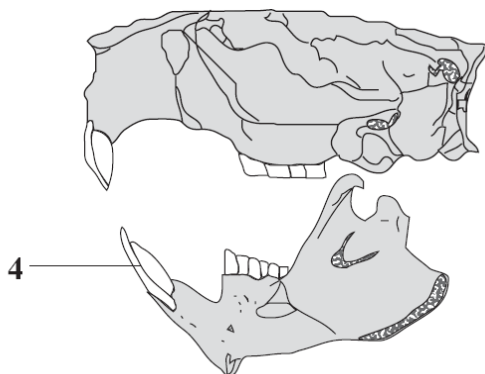
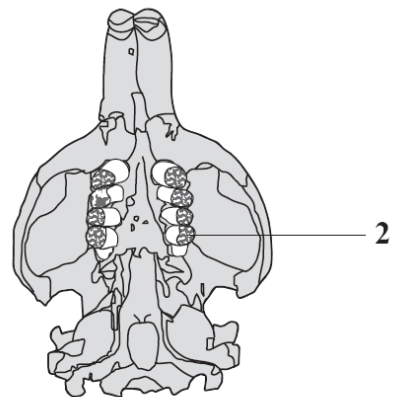
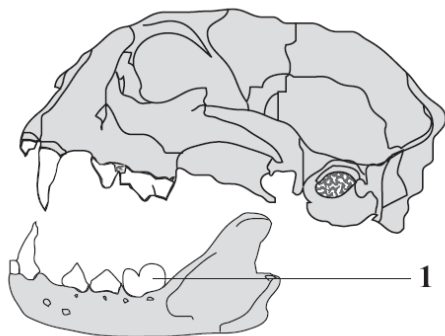


- (b) State the function (job) of this molar tooth. Explain how this particular type of tooth is suited to this function.

Function:

How it is suited:

- (c) The diagrams show the teeth in several animal skulls. (Diagrams are not to scale.)



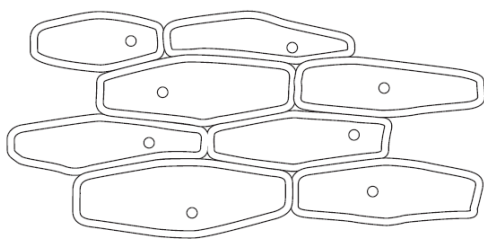
Match numbers **1– 4** on the diagrams with these descriptions.

sharp & pointed to grip prey	used to bite food	used to crush food and grind food	used to shear meat and crush bones

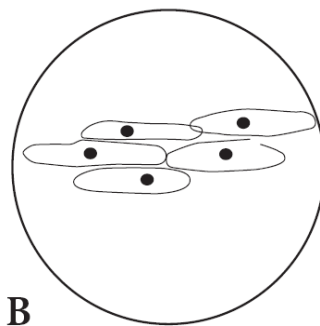
Question Five: CELLS & THE MICROSCOPE [5 marks]

Look at the two drawings of an onion cell. **A** is drawn properly. **B** is not.

onion cells



A magnification = $\times 100$



B

- (a) By comparing the two sets of drawings, explain what you must do to draw microscope specimens properly. Give at least THREE ideas.

- (b) What do the following parts of the microscope do?

(i) eyepiece and objective lenses

(ii) stage clips

(iii) focusing knob

(c) Here are two single celled creatures that are often found in pond water.

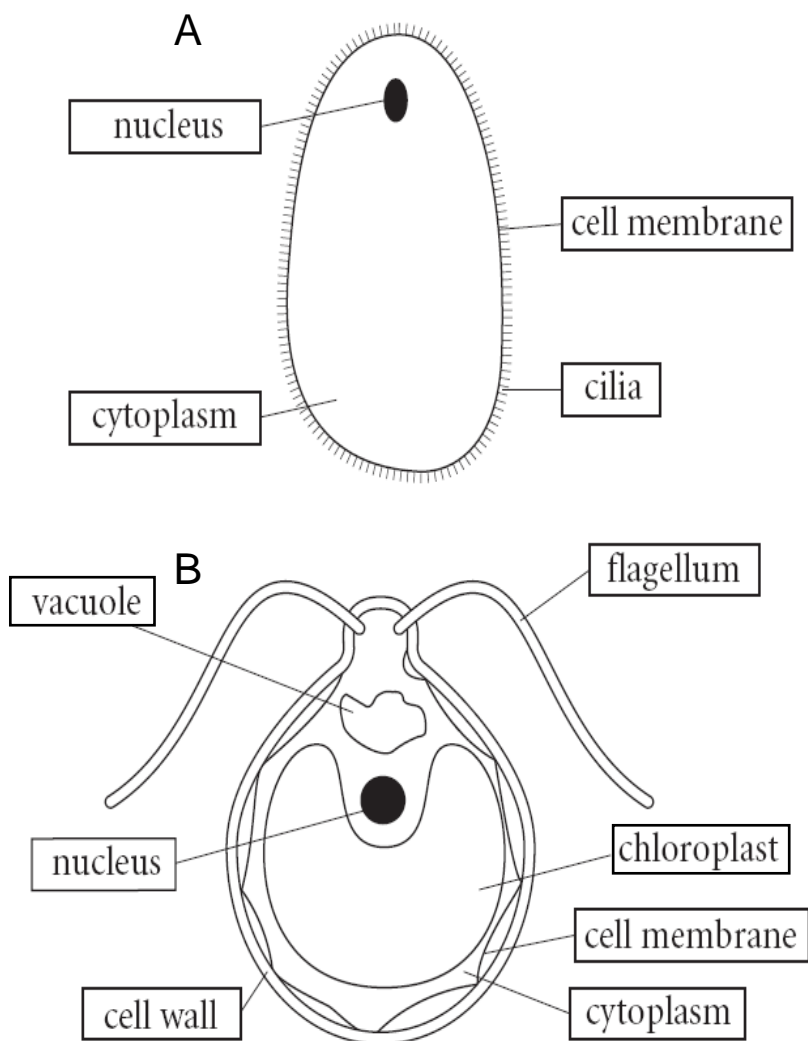
Which one is a plant cell? Give THREE reasons.

Creature A / B (circle answer)

1.

2.

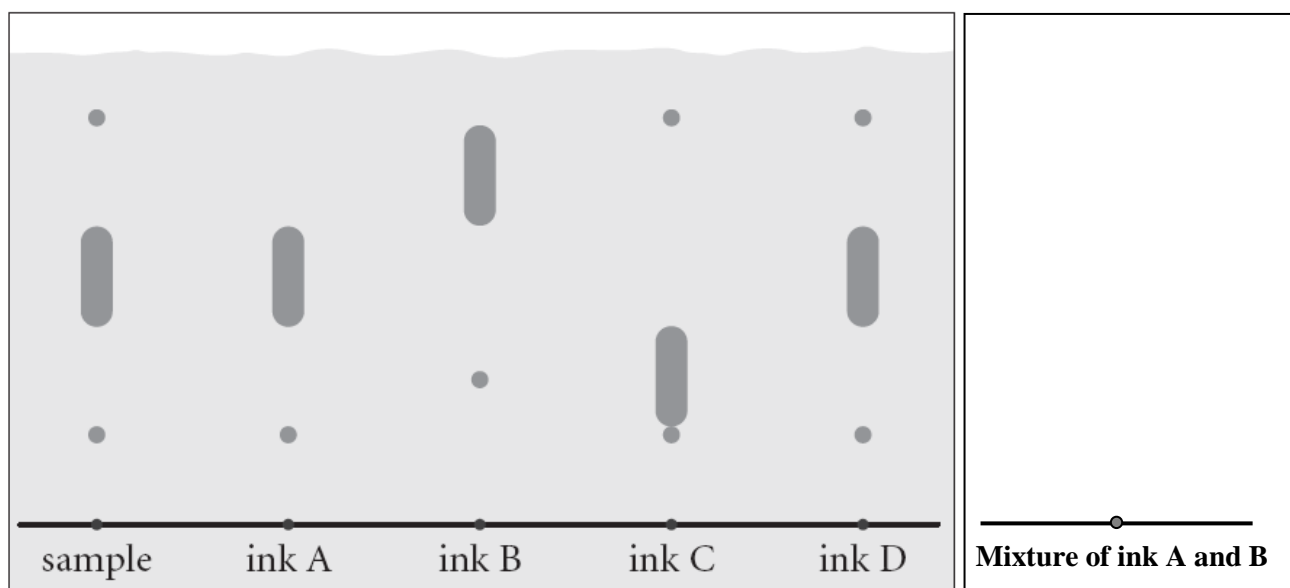
3.



Question Six: CHROMATOGRAPHY [4 marks]

Look at the chromatogram below.

Draw answer to (c) here



- (a) Which ink (A, B, C or D) is present in the ink sample from the pen. _____
Explain your answer.

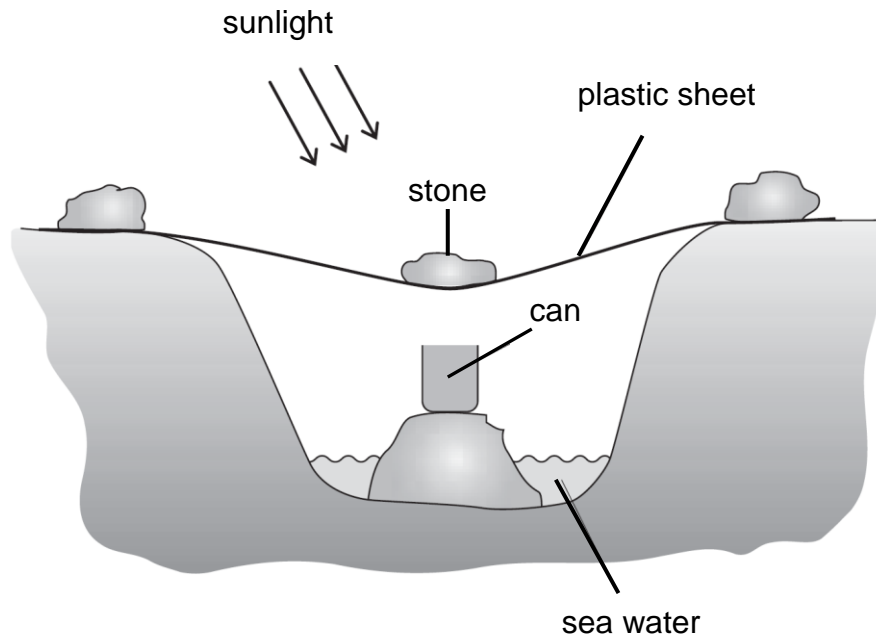
- (b) How might chromatography be useful to the police if they were investigating who sent some handwritten threatening letters?

- (c) Draw, as accurately as possible, the chromatogram you would get from a mixture of ink A and ink B, on the “paper” above. (Hint: use a ruler to help).

- (d) Explain why a chromatogram from a mixture of ink B with ink C might be confusing.

Question Seven: SHIPWRECKED [3 marks]

Alice was shipwrecked on a desert island which had no water supply at all. She salvaged some plastic sheet and a can from the wreck and arranged it as in the diagram below. She set it up in a position where it would be in the hot sun all day and left it. Drops of water collected on the underside of the plastic sheet which fell into the can.



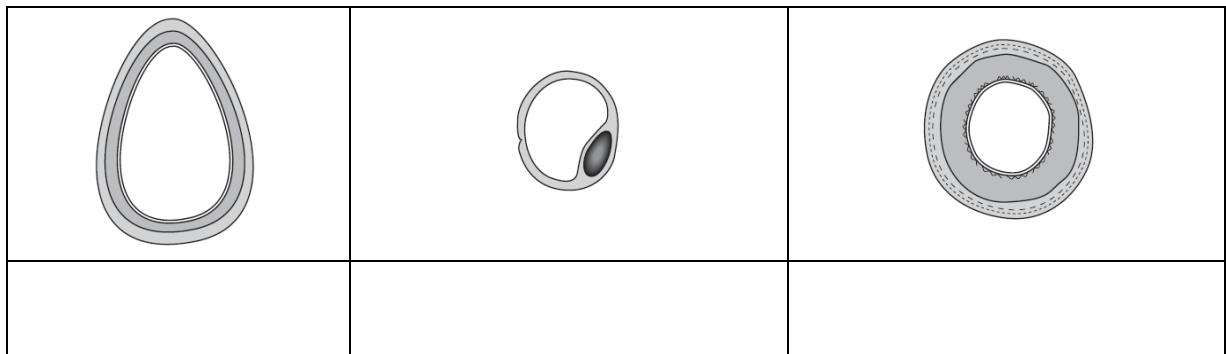
- (a) Discuss, in detail, what happens to the water in the hole?

- (a) Explain what happens to the salt in the sea water?

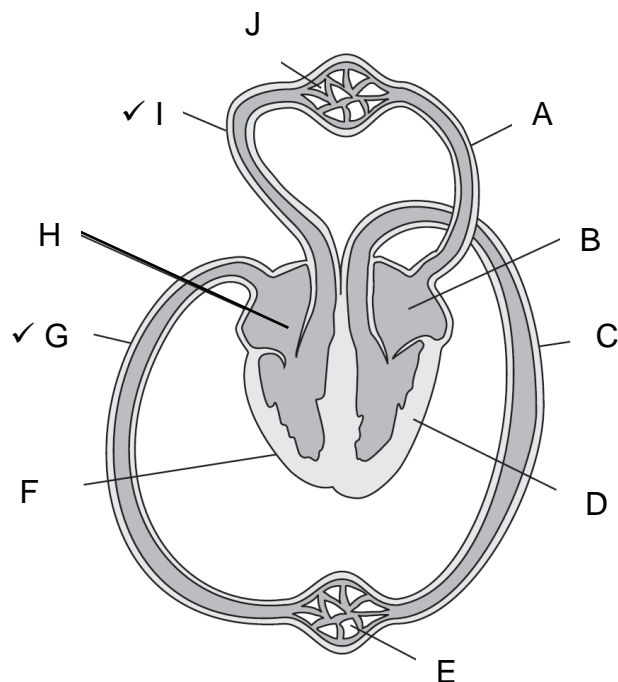
- (b) Explain why the drops of water collect on the underside of the plastic sheet.

Question Eight: CIRCULATION [4 marks]

- (a) Label each blood vessel with the correct label: *artery* *vein* *capillary*



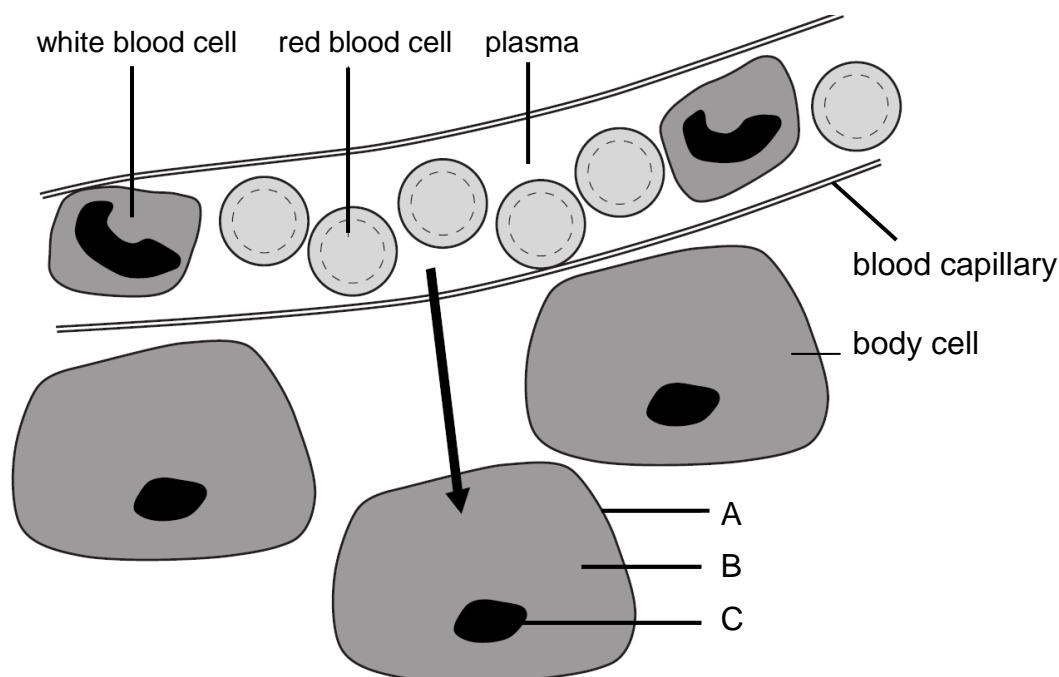
- (b) Match up the labels below with the correct letter. Write each letter in the box. G and I have been done for you.



- ☒ I artery to lungs carries blood with little oxygen
- ☐ artery to body taking blood carrying oxygen
- ☐ oxygen enters blood in lungs
- ☐ oxygen taken from blood by body cells
- ☐ thick muscular wall of left ventricle

- ☐ right ventricle
- ☐ right atrium
- ☐ left atrium
- ☐ vein from lungs carrying oxygen-rich blood
- ☒ G vein from body carrying blood with little oxygen

The diagram shows a blood capillary and several body cells.



(c) Name the structures labelled A, B and C.

A

B

C

(d) Name one substance that moves in the direction shown by the arrow.

(e) The body cells produce carbon dioxide which passes into the blood. What **process** that occurs in the cells produces the carbon dioxide?

Question Nine: PARTICLES & THE ATOM [4 marks]

(a) Helium is used to fill party balloons. Tick the TWO properties that make helium suitable for filling party balloons.

☐

colourless

☐

low density

☐

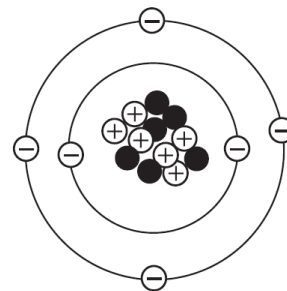
small atoms

☐

unreactive



(b) The diagram shows the structure of a carbon atom.

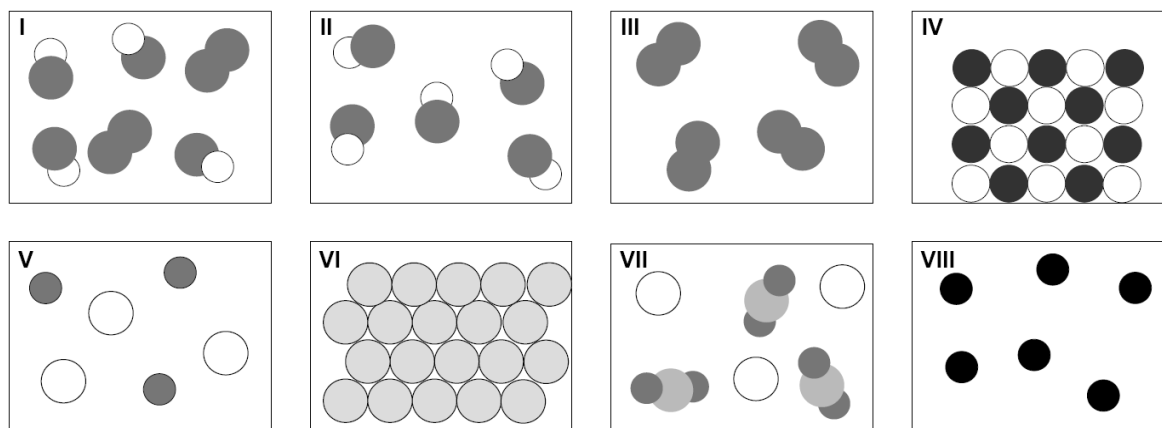


(i) Protons and neutrons are in the centre of the atom. What is the name for this part of the atom?

(ii) What is the atomic number of this atom?

(iii) What is the mass number of this atom?

(c) Elements are composed of only one kind of atom. Compounds are composed of two or more different elements, chemically combined. Mixtures are composed of elements or compounds which are not chemically combined.



Study the diagrams above and select the **one** which **best** fits the description given.

A solid element	VI
A mixture of elements	
A gaseous element	
Molecules of a compound	

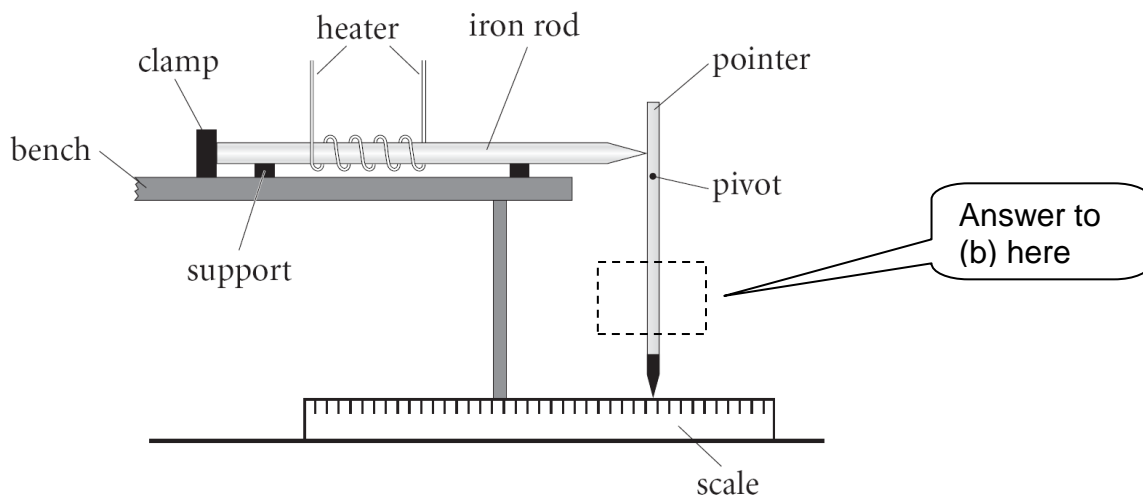
Molecules of an element	
A solid compound	
A mixture of molecules	
Atoms and molecules	

(d) Complete the table.

Compound	Formula	Number of atoms present
calcium chloride	CaCl_2	one atom of calcium, two atoms of chlorine
sodium carbonate	Na_2CO_3	_____ atom(s) of sodium _____ atom(s) of carbon _____ atoms(s) of oxygen
Magnesium sulfate	_____	one atom of magnesium, Mg one atom of sulfur, S four atoms of oxygen, O

Question Ten: EXPANSION [4 marks]

The diagram shows some apparatus used for demonstrating that a metal rod expands when heated.

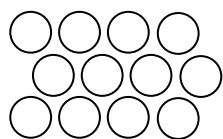


- (a) Explain why the pointer moves when the rod is heated.

- (b) Put an arrow in the box on the diagram to show which direction the pointer would move.

- (c) Tick the ONE diagram which best shows what happens to the particles when the iron rod is heated.

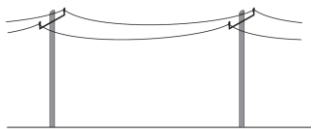

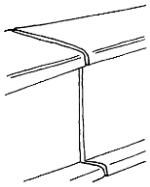
Particles before heating



Particles when the iron rod is heated (tick one)

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

(d) Explain ONE of the following. Tick the one you have chosen like this ☒

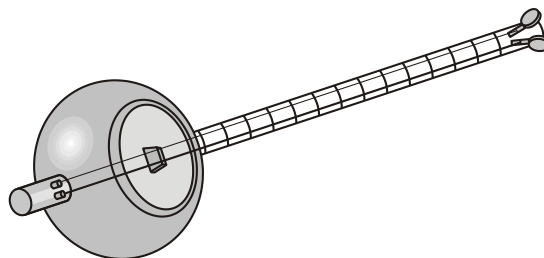
<p>The diagram shows telephone wires that have been put up in warm weather. Why is it important that the wires have been left slack (loose)?</p>  <input type="checkbox"/>	<p>Kaz is trying to open a jar of jam. The lid is metal, and it is stuck. His mum suggests running it under the hot tap. Why?</p>  <input type="checkbox"/>	<p>David's dad is laying new steel tracks along a railway line. He leaves gaps between each length of track. Why?</p>  <input type="checkbox"/>
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(e) Choose the **best** explanation to explain each statement. Join the O's to the O's.

statement	because	explanation
Diffusion happens more quickly in gases than in liquids <input type="radio"/>		<input type="radio"/> the particles are closely packed together <input type="radio"/> the particles are spread far apart <input type="radio"/> the particles lose energy and move closer together
Solids are usually more dense than liquids or gases <input type="radio"/>		<input type="radio"/> solid particles are more closely packed together than liquid or gas particles <input type="radio"/> the particles move around but stay close together
Liquids have a fixed volume <input type="radio"/>		<input type="radio"/> the particles gain energy and move around more <input type="radio"/> gas particles move around more freely than liquid particles
A gas condenses when cooled <input type="radio"/>		<input type="radio"/> the particles cannot move around, but only vibrate

Question Eleven: SOUND [2 marks]

The dotar is a musical instrument with two strings. A student plays the dotar.



- (a) The student plays the dotar very quietly. What must he do to the strings to make a louder sound?

- (b) He makes the strings tighter so they vibrate more quickly. How does this affect the sound produced by the strings? Tick the correct box.

☐

The sound has a lower pitch.

☐

The sound has a higher pitch.

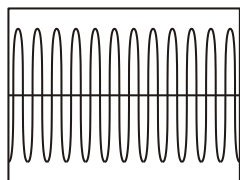
☐

The sound is louder.

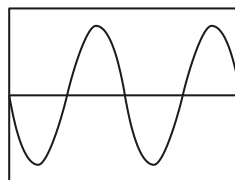
☐

The sound is quieter.

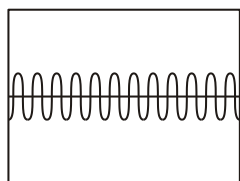
- (c) The student played the dotar near a microphone connected to an oscilloscope. Which diagram shows a quiet (low volume), low pitched sound? Circle the letter.



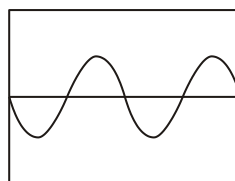
A



B



C



D

- (d) A rocket was fired above a seaside town to call out the lifeboat crew. The rocket exploded, giving out light and sound at the same time. Lisa was outside the town. She saw the flash of the rocket exploding and heard the bang.

Which sentence is true? Tick the correct box.

☐

She heard the bang first.

☐

She saw the flash first.

☐

She heard the bang and saw the flash at the same time.

Give the reason for your answer.


END OF EXAM – CHECK YOUR ANSWERS

Assessment Schedule 9C 2008

() means additional, not really required eg. Gauze (mat) – gauze would be sufficient
: means AND eg. red : hot - answer needs red and hot.

18

Two (a)	3-4 correct of: Potatoes Meat Cabbage milk	1 mark
(b)	If 100 g contains 20 g of carbohydrate then 40 g contains $40/100 \times 20$ $40/100 \times 20 = 8$ g: mark for answer and some relevant working	1 mark
(c)	Food C PLUS a valid argument eg $B = 50 + (10 \times 2) + 6 = 76$ but $C = 42 \times 2 = 84$...("units of energy")	1 mark
(d)	5 correct of Oesophagus Liver Stomach Pancreas Small intestine Large intestine anus	1 mark
Three (a)	Pupil gets smaller : to limit amount of light into eye / prevent eye from damage	1 mark
(b)	Image is not clear on the retina (or equivalent idea implying fuzziness due to the scattering of light) / less light falling on the retina	1 mark
(c)	Would not be able to see : optic nerve carries message to the brain (or equivalent)	1 mark
Four (a)	Both correct: Nerves & blood vessels = C enamel = A	1 mark
(b)	Crushing/grinding/chewing : flattened / ridged	1 mark
(c)	All correct: 3 4 2 1	1 mark
Five (a)	Any 2 ideas – 1 mark; any 3 ideas – 2 marks <ul style="list-style-type: none"> • Has a title & includes magnification • Cells not coloured/shaded • Attention to detail eg cell wall drawn as double line / diagrams should show features • Field of view is NOT drawn • Large and clear diagram / diagrams large enough to show detail • Plant cells drawn in a more regular shape There may be other answers NOT – draw in pencil – who is to say these haven't been ☺	2 marks max.
(b)	2 correct answers needed (i) magnify (object) (ii) hold slide/specimen in place (on the stage) (iii) adjusts distance between slide and lens to focus on the slide (NOT just "to focus")	1 mark
(c)	Circles B + 2 reasons = 1 mark, circles B + 3 reasons = 2 marks <ul style="list-style-type: none"> • Has a (large) vacuole • Has chloroplast • Has cell wall 	2 marks max.

	References to overall cell shape are not accepted since this is a pretty unusual plant cell.		
Six (a)	D : pattern of separation/spodges/dots etc of ink D is same as sample		1 mark
(b)	Compare suspects pen with sample : look for match		1 mark
(c)	Look for attempt to combine the results of A&B into one result – see opposite		1 mark
(d)	Successfully explains that the “circle” of B would be under/combined with/hidden by the “bullet” of C – may draw on the diagram to explain		1 mark
Seven (a)	It is heated by the sunlight / warmed : evaporates / turns from liquid to gas/vapour (NOT steam) – NEEDS idea of heat energy being involved in the evaporation process		1 mark
(b)	It does not evaporate / it remains in the sea water / it is left in the hole		1 mark
(c)	The water (vapour) could not escape : water vapour condensed on the (cooler) plastic		1 mark
Eight (a)	All 3 correct: Vein capillary artery		1 mark
(b)	6 correct answers		1 mark
	I	F	
	C	H	
	J	B	
	E	A	
	D	G	
(c)	All correct: cell membrane cytoplasm nucleus		1 mark
(d)	oxygen / glucose / water	One or both correct	1 mark
(e)	respiration		
Nine (a)	Low density : unreactive BOTH ticked		1 mark
(b)	Nucleus	Two or three correct	1 mark
(c)	6		
(d)	12		
(e)	5 or more correct		1 mark
	VI	III	
	V	IV	
	VIII	I	
	II	VII	
(f)	2 x Na, 1 x C, 3 x O MgSO ₄ (don't be too demanding about the subscripted 4)		1 mark

Ten (a)	Metal / rod : expands : bar pushes the pointer		1 mark
(b)	Correct arrow (←)	Both correct	1 mark
(c)	Top left diagram of the 4 (particles same size but more spaced out)		
(d)	A correct answer involving the mention of expansion/contraction as appropriate <u>AND</u> a consequence Eg Telephone wires would contract when it is colder : might snap if they had been put up without any slack / might pull the poles over! The lid expands more than the glass : so it's easier to get off. Tracks can expand in hot weather : without buckling		1 mark
(e)	Any 2 correct links made Diffusion happens..... gas particles move around more freely than... Solids are usually.... solid particles are closely packed / the particles are closely packed together... Liquid have a fixed...The particles move around but stay close ... A gas condenses when.... The particles lose energy and move....		1 mark
Eleven (a)	Pluck strings harder / pull strings further	2 correct	1 mark
(b)	The sound has a higher pitch		
(c)	D		
(d)	Flash first : light travels faster than sound		1 mark
			40 marks