

Visit
FREETESTPAPER.com
for more papers



Website: freetestpaper.com



[Facebook.com/freetestpaper](https://www.facebook.com/freetestpaper)



[Twitter.com/freetestpaper](https://www.twitter.com/freetestpaper)



REGENT SECONDARY SCHOOL
END-OF-YEAR EXAMINATIONS 2022
SECONDARY ONE (EXPRESS)

NAME: _____

INDEX NUMBER: _____

CLASS: _____

SETTER: MS AISHA YASMIN

SCIENCE

13 October 2022

2 hours

Additional Materials: Multiple Choice Answer Sheet

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.

Do not use staples, paper clips, glue or correction fluid.

Write your name, class and index number on the Answer Sheet in the spaces provided unless this has been done for you.

Section A

There are **thirty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A, B, C** and **D**.

Choose the **one** you consider correct and record your choice in **soft pencil** on the Multiple Choice Answer Sheet.

Section B and C

Answer **all** questions in the spaces provided.

The number of marks is given in brackets [] at the end of each question or part question.

A copy of the Periodic Table is printed on page 31.

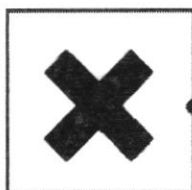
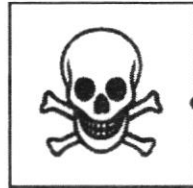
The use of an approved scientific calculator is expected, where appropriate.

	TARGET
PARENT'S SIGNATURE	

Section A (30 marks)

Choose the correct answer and shade it in the spaces provided on the Multiple Choice Answer Sheet.

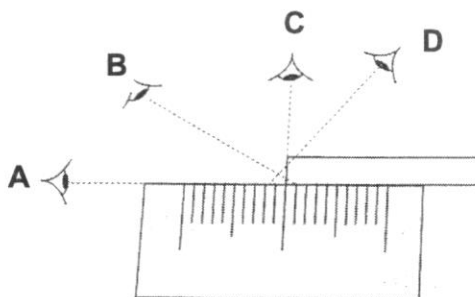
- A1** Which of the following hazard symbols should be used to label a bottle of kerosene?

A**C****B****D**

- A2** Which of the following actions should **not** be carried out in a science laboratory?

- A** Close the air holes before lighting a Bunsen burner
- B** Point the mouth of the test tube away from yourself and others when heating a solution
- C** Taste chemicals to better understand the study of science
- D** Wear goggles when heating or handling chemicals

- A3** The diagram below shows an observer reading the measurement from a metre rule. Which position would **not** give rise to parallax error?



- A4** In an experiment, a student measured the length of a leaf once per day over a period of four days. The results are shown in the table below.

day	Length of leaf (cm)
1	3.2
2	3.1
3	5.2
4	3.2

The student realised that the measurement for Day 3 might be wrong. What should he do?

- A** Accept the measurement and find out why the measurement was wrong so that it is not repeated.
- B** Disregard the entire experiment.
- C** Modify the measurement to be similar to the other measurements.
- D** Take one more measurement and replace the measurement for Day 3.

- A5** Physical properties of 4 materials are given in the table below.

material	P	Q	R	S
heat conductivity	good	poor	good	poor
electrical conductivity	poor	poor	good	good

Which material is likely to be a metal?

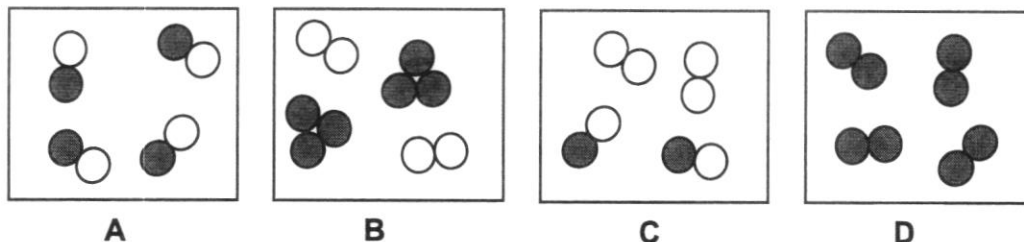
- A** material P
 - B** material Q
 - C** material R
 - D** material S
- A6** A student wanted to test one of the physical properties of matter. He tried to use a steel key to scratch the handphone screen.

Which property of materials is she trying to test?

- A** hardness
 - B** strength
 - C** stiffness
 - D** scratchiness
- A7** Which pair of instruments are needed to find the density of a marble?
- A** electronic balance and measuring cylinder
 - B** electronic balance and ruler
 - C** measuring cylinder and thermometer
 - D** ruler and measuring tape
- A8** What is the SI unit for mass?

- A** centimetre
- B** gram
- C** kilogram
- D** milligram

- A9** Which of the following diagrams represents a mixture of an element and a compound?



- A10** A compound has the chemical formula CuSO_4 . Which of the following gives the correct number of atoms of the elements in the compound?

- A** 1 carbon, 1 silicon and 4 oxygen atoms
B 1 carbon, 1 sulfur and 4 oxygen atoms
C 1 copper, 1 sulfur and 4 oxygen atoms
D 1 copper, 4 sulfur and 4 oxygen atoms

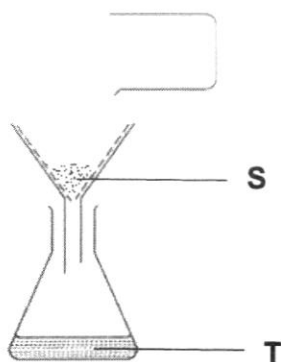
- A11** Why is air considered a mixture?

- A** It is a gas at room temperature.
B It does not have a fixed composition.
C It can be separated by chemical methods.
D It has different properties from its components.

- A12** Which of these changes will speed up the rate of dissolving the most?

	size of particles	temperature of surroundings
A	decrease	decrease
B	decrease	increase
C	increase	decrease
D	increase	increase

A13 The experimental set-up below was used to separate a mixture.



What is solid **S** and liquid **T** known as?

	solid S	liquid T
A	residue	filtrate
B	residue	distillate
C	filtrate	residue
D	distillate	filtrate

A14 The purpose of boiling chips in a distillation set-up is to

- A** ensure smooth boiling
- B** lower the temperature of the mixture in the flask to prevent overheating.
- C** prevent the components of the mixture from chemically reacting together
- D** enhance the purity of the distillate

A15 Which statement correctly explains why we can see a luminous object?

- A** The object emits light into our eyes.
- B** The object absorbs all the light that falls onto it.
- C** The object absorbs light that reflects from our eyes.
- D** The object reflects the light that falls onto it into our eyes.

A16 When a shop-owner looked at a mirror at the corner of her shop, she is able to see many customers in the shop, but they looked smaller.

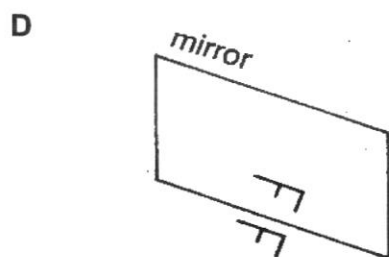
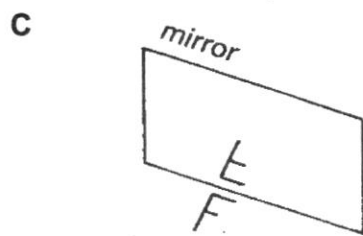
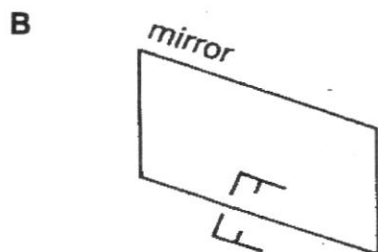
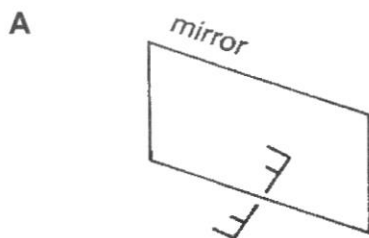
Which type of mirror is being described here?

- A** concave mirror
- B** convex mirror
- C** plane mirror
- D** rough mirror

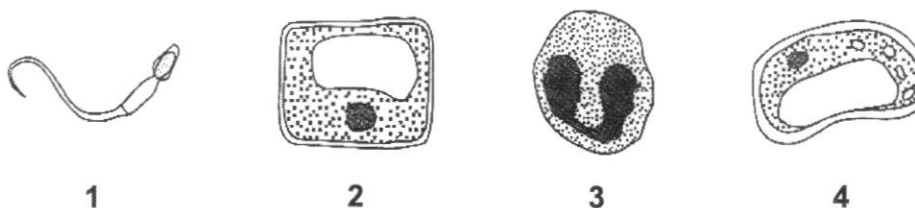
A17 Which of the following is a harmful effect of light pollution?

- A** disrupted sleep cycle
- B** getting skin cancer
- C** owls hunting at night
- D** studying at night

- A18** The letter 'F' can be placed in front of a plane mirror in four different ways. Which diagram shows the **incorrect** image formed in the mirror?



- A19** The diagrams below show four different cells as seen through a microscope.



Which two cells are plant cells?

- A** 1 and 2
B 1 and 3
C 2 and 3
D 2 and 4
- A20** The flower is an example of an organ because it has
- A** a group of cells performing a similar function
B a group of tissues performing a similar function
C different groups of tissue working together to perform a similar function
D different groups of systems performing a similar function
- A21** Which statement best describes the benefit of having division of labour in a multicellular organism?
- A** It enables better defence against infection.
B It enables more efficient functioning of many processes.
C It reduces the amount of work.
D It reduces the number of cells.
- A22** Which statement is **true** about cells in living organisms?
- A** All cells contain a cell wall to maintain their shape.
B A multicellular organism contains multiple cells of different types.
C A unicellular organism contains many different types of cells.
D A group of organisms forms a system.

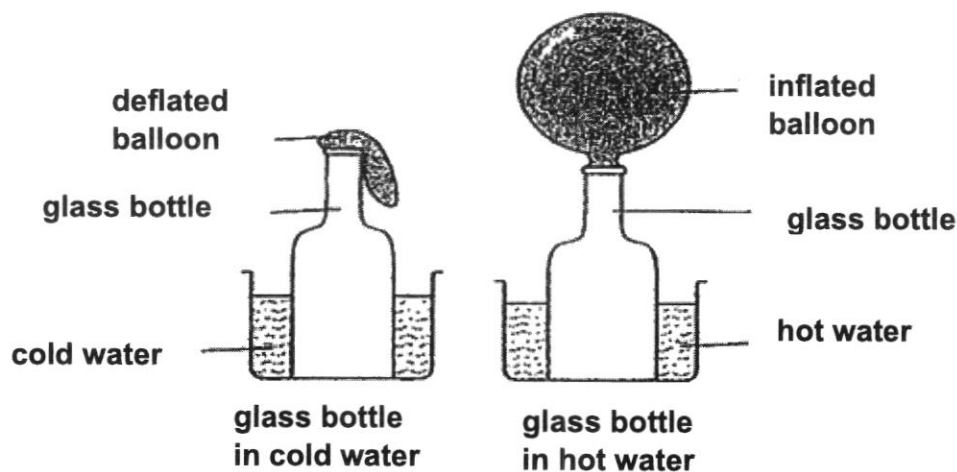
A23 The characteristics of particles in mercury at room temperature are that

- I the particles move very rapidly.
- II the particles vibrate about fixed positions.
- III the particles are spaced slightly apart.
- IV the particles are not fixed in their positions.

Which of the following statements are true?

- A** I and II
- B** II and III
- C** I and IV
- D** III and IV

A24 Sarah attached a deflated balloon to a glass bottle and placed it in a basin of cold water as shown in the diagram below. After 5 minutes, the balloon remain deflated. Later, she placed the same glass bottle into a basin of hot water and the balloon become inflated.



Which of the following is true about the gas particles after the balloon became inflated after being placed in hot water?

- A** The gas particles are more closely packed.
- B** The gas particles move at a faster speed.
- C** The number of gas particles increases.
- D** The size of the gas particles increases.

A25 Which of the following metals is a liquid at 30 °C?

	metal	melting point/ °C	boiling point/ °C
A	caesium	29	685
B	potassium	63	766
C	rubidium	39	701
D	sodium	98	890

A26 In which of these substances are the particles in fixed positions?

- A** carbon dioxide gas
- B** molten iron
- C** steel rod
- D** tea

A27 Gases are more compressible than liquids because particles in a gas.....

- A** are colourless and cannot be seen
- B** are further apart than in a liquid
- C** are more packed than liquids
- D** have stronger forces of attraction between the particles

A28 Which of the following statements about atoms is true?

- A** Atoms are positively charged.
- B** Atoms have lesser electrons than protons.
- C** Atoms have the same number of protons and neutrons.
- D** Atoms of the same element have the same proton number.

A29 Elements are arranged in the periodic table in order of increasing number of

- A** atoms
- B** electrons
- C** neutrons
- D** protons

A30 A newly discovered element **Lisanium** (Ls) contains 111 protons and 141 neutrons. Which of the following represents an atom of **Lisanium**?

- A** $^{141}_{30}\text{Ls}$
- B** $^{111}_{30}\text{Ls}$
- C** $^{141}_{111}\text{Ls}$
- D** $^{252}_{111}\text{Ls}$

Section B [40 marks]

Answer **all** questions in the spaces provided.

B1 Draw the sectional diagram of the following apparatus found in the school laboratory.

(a)	tripod stand	(b)	measuring cylinder

[2]

[Total: 2]

B2 (a) Refer to fig. 2.1 below of a Bunsen burner used in a school laboratory and answer the following questions.

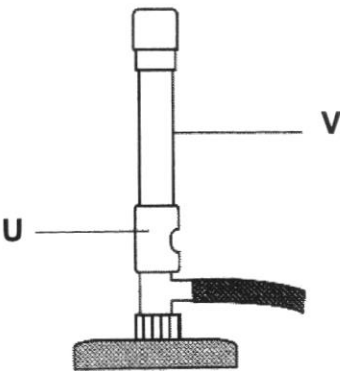


Fig.2.1

Name of **U**:

Name of **V**:

[1]

(b) State two properties of the flame produced when the air-hole is closed.

- 1.
-
- 2.
-

[2]

[Total:3]

B3 A student conducted an experiment to test a physical property of four different rulers made of different materials. A simple test was done on each ruler as shown in Fig. 3.1 (figure not drawn to scale) to see which ruler could support the heaviest weight before breaking.

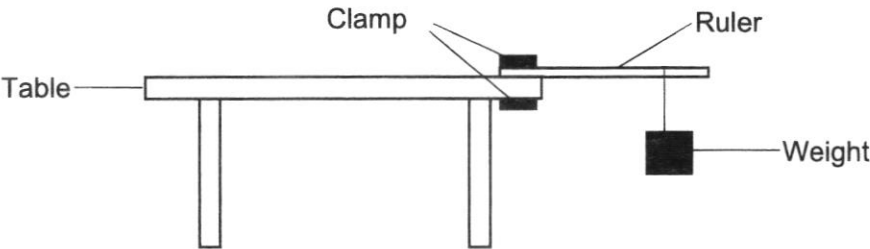
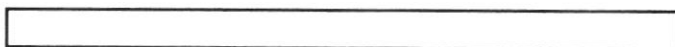


Fig. 3.1

The 4 rulers' length and material in the test are as shown:

	Wood
	Metal
	Glass
	Plastic

(a) Which physical property of the material was being investigated in the above experiment?

.....

[1]

- (b) Define the physical property identified in part (a).

.....

..... [1]

- (c) Another student who had been observing the experiment commented that this was not a fair experiment.

Explain, with reference to the information above, why the experiment was not fair and how this could be corrected.

.....

.....

..... [2]

- (d) Predict which of the 4 rulers can support the heaviest weight before breaking.

..... [1]

[Total:5]

B4 Fig 4.1 shows the labels found on a bottle of vitamin supplements.

Nutrition Facts	
Serving Size 2/3 cup (55g)	
Servings Per Container About 8	
Amount Per Serving	
Calories 230	Calories from Fat 72
% Daily Value*	
Total Fat 8g	12%
Saturated Fat 1g	5%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 160mg	7%
Total Carbohydrate 37g	12%
Dietary Fiber 4g	16%
Sugars 1g	
Protein 3g	
Vitamin A	10%
Vitamin C	8%
Calcium	20%
Iron	45%
* Percent Daily Values are based on a 2,000 calorie diet. Your daily value may be higher or lower depending on your calorie needs.	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g

Fig.4.1

- (a) Identify one element and one compound from the food label.

Element:

Compound:

[2]

- (b) State whether the vitamin supplement is a pure substance or a mixture.
Explain your answer.

.....

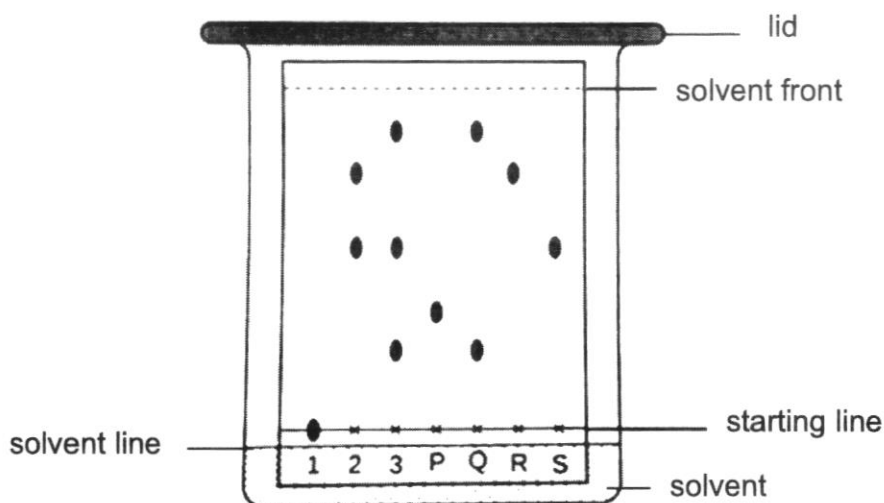
.....

.....

[2]

[Total:4]

- B5** The diagram shows a chromatogram obtained from an experiment. It is used to identify the components **P**, **Q**, **R** and **S** present in the three samples **1**, **2**, and **3**.



- (a) Suggest a suitable solvent for this experiment.

..... [1]

- (b) Which components (**P**, **Q**, **R** and **S**) is/are a pure substance? Explain why.

..... [2]

- (c) State the components (**P**, **Q**, **R** and **S**) which is/are used to make sample **3**.

..... [1]

- (d) Suggest a reason why the beaker is covered with a lid.

..... [1]

[Total:5]

B6 State the correct Electromagnetic (EM) Radiation for the given application below.

application	EM radiation
(a) detect forged dollar note	
(b) optical fibre network	
(c) thermal imaging camera	

[3]

[Total:3]

B7 Fig. 7.1 shows the position of a point object A and the eye in front of a plane mirror MN.

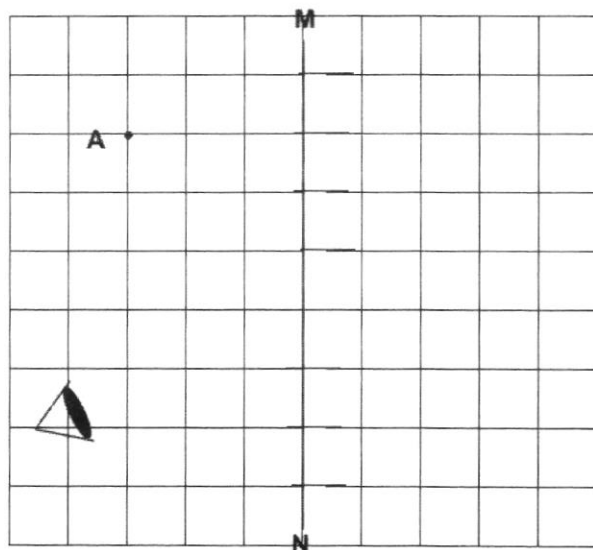


Fig. 7.1

- (a) Mark the position of the image of the object **A** in the mirror. Label the image as **I**. [1]
- (b) Draw the paths of two light rays which leave the object **A** and reach the eye after reflection at the mirror. [2]

(c) State two characteristics of the image formed by a plane mirror.

1.

.....

2.

..... [2]

[Total:5]

B8 Fig. 8.1 shows the joint on a bridge made of metal.

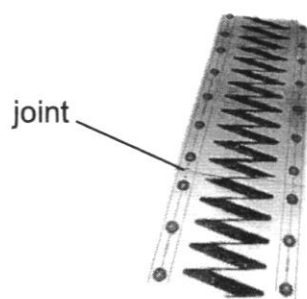


Fig. 8.1

(a) Explain why there is a gap in the joint of a bridge.

.....

..... [2]

(b) State how the mass, volume and density of the metal joint changes (if any, ie. increase/ decrease/ remains the same) on a very hot day.

mass:

volume:

density:

[2]

[Total:4]

B9 Fig. 9.1 shows some cells under a light microscope.

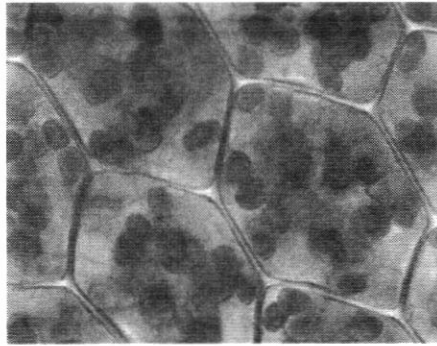


Fig. 9.1

- (a)** The cells form a tissue. Explain why Fig. 9.1 shows a tissue.

.....
 [2]

- (b)** Student **A** showed Fig. 4 to her friends, Student **B** and Student **C**. Upon seeing the cell, Student **B** claimed it was a plant cell but Student **C** does not think it was a plant cell.

Give one reason to support Student **B**'s claim.

..... [1]

- (c)** State one other difference between a plant cell and an animal cell.

.....
 [1]

[Total:4]

- B10 (a)** Construct a table to show the relative charge and relative mass of a proton, electron and neutron in an atom. [3]

- (b)** Explain why an atom is known as 'electrically neutral'.

.....

.....

[2]

[Total:5]

Section C [30 marks]

Answer **all** questions in the spaces provided.

- C1** Fig 1.1 shows three experimental set-ups that a student prepared to investigate factors which affect the rate of dissolving.

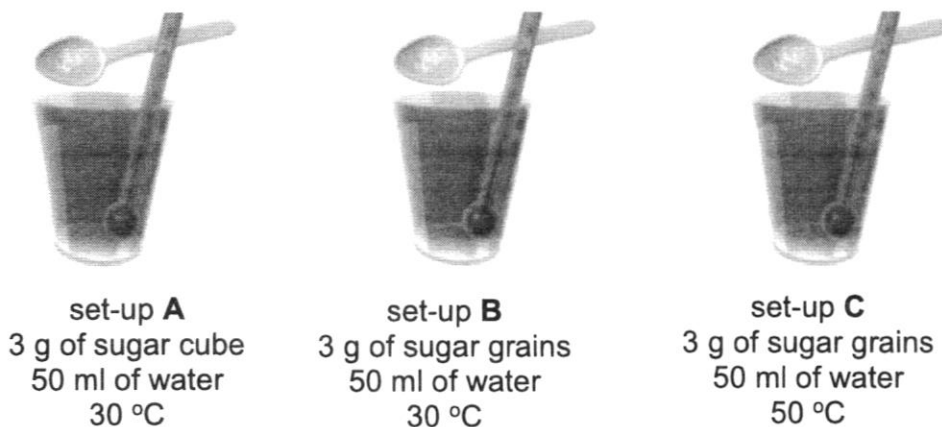


Fig 1.1

- (a) In which set-up will the sugar dissolve the fastest?
Explain your answer.

.....

[3]

- (b) The following comment was made by another student about the experiment. State and explain whether the student is right or wrong.

“Stirring faster will cause the sugar to become more soluble”.

.....

[2]

- (c) Complete Table 1.1 on the differences between solutions and suspensions.

Solutions	Suspensions

[3]

Table 1.1

- (d) State the separation technique which can be used to obtain the following:

(i) Pure water from a salt solution:

(ii) Water from chalk and water: [2]

[Total: 10]

C2 A group of students are learning about cells and the use of microscope. They collected some pond water samples and were recorded their observations followed by some discussion.

(a) In Fig. 2.1, draw and label a cell which has the following structures only:

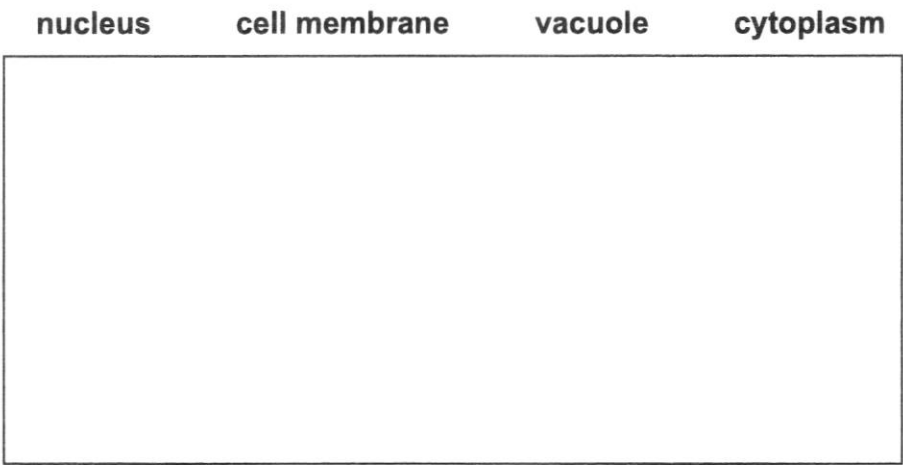


Fig. 2.1

[4]

(b) One of the student says, “The nucleus is where most of the chemical reactions in the cell occur.”

Explain why the student is **wrong** by filling in the table below.

structure	function
nucleus	
	where most of the chemical reactions occur

[2]

- (c) The microscope is an example of how science and technology has brought benefit to society by allowing scientist to observe small organisms and study about cells.

Give one example each of how science and technology has bring about benefit and harm to society and the environment.

benefit:

.....

harm:

.....

[2]

- (d) The students collected some data listed below. Help them to categorised the data as qualitative or quantitative by ticking in the correct boxes.

data collected	qualitative	quantitative
Volume of pond water collected is 10 cm ³ .		
The cell observed is green with slight yellow tint.		
The pond water has an unpleasant smell.		

[2]

C3 How is gold extracted?

Smelting, which results in nearly pure gold, involves melting the negative gold-bearing solution in a furnace at about 1 200 degrees C. When workers add a chemical mixture known as flux to the molten material, the gold separates from the metal used to make the terminals. Workers pour off the flux and then the gold. Molds are used to transform the liquid gold into solid bars. These low-purity bars are then sent to refineries all over the world for further processing.

The above excerpt is taken from
<https://science.howstuffworks.com/gold4.htm>

- (a)** State **two** physical properties that make gold suitable for making jewellery.

physical properties 1

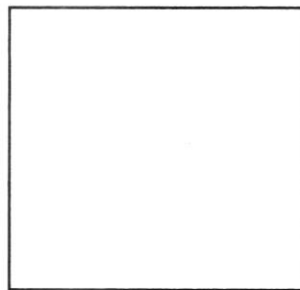
physical properties 2 [2]

- (b)** Gold has a melting point of 1064 °C and a boiling point of 2700 °C. It has a density of 19.3 g/cm³.

- (i)** Draw the arrangement of gold particles at different temperatures in the boxes provided.



1000°C



1200°C

[2]

- (ii)** Can gold be easily compressed at 1200°C? Explain your answer.

.....

[2]

- (b) (iii) Describe the arrangement and movement of particles of gold at 3000 °C.

.....
.....
.....
..... [2]

- (c) (i) A piece of gold token was measured to have a mass of 36.5 g and a volume of 3.1 g/cm³.

Calculate the density of this gold token.

density = g/cm³ [1]

- (ii) From your answer, in (c)(i) explain if the gold token is made from pure gold.

..... [1]

[Total:10]

– End of Paper –

Marking scheme

Science EOY

1Express

** in answers that contain an incorrect point + a correct point, 1 mark will be deducted

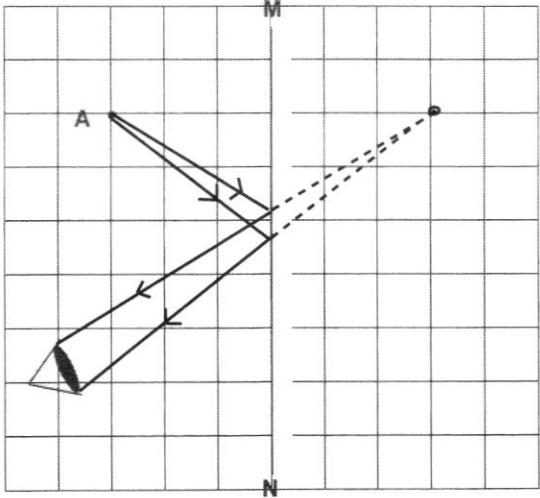
Sec A

1	2	3	4	5	6	7	8	9	10
B	C	C	A	C	A	A	C	C	C
11	12	13	14	15	16	17	18	19	20
B	B	A	A	A	B	A	D	D	C
21	22	23	24	25	26	27	28	29	30
B	B	D	B	A	C	B	D	D	D

Sec B

B1	(a)	 Tripod stand	1 mark R: • 3rd leg is drawn • drawn without ruler • 3D drawings • Single line
	(b)	 Measuring cylinder	1 mark Reject: • 3D drawings • No base
B2	(a)	Name of U: Collar Name of V: Barrel	Both for 1 mark
	(b)	Orange Unsteady Hot Reject: very hot/hotter Accept: less hot Soot produced Can be seen <u>clearly/easily</u> Luminous flame/bright <i>No extra marks for additional correct properties, but minus 1 mark for every incorrect property. No marks for answers that do not answer the question, eg comparing luminous and non-luminous flames.</i>	Any two answers 1 mark each

B3	(a)	Strength	1 mark
			No marks awarded if more than one property is given
	(b)	It is the ability to withstand a <u>load/mass/weight without breaking/changing shape</u> . ECF if wrong answer is given in (a) Mark is awarded if correct definition is provided for answer in (a)	1 mark
	(c)	The rulers used are not of equal <u>length</u> . The student should have ensured all the rulers are of equal <u>length</u> . R: size (ECF if "size" is stated) (accepted other methods which suggest equalizing the length across all the rulers)	1 mark 1 mark
	(d)	Metal	1 mark
B4	(a)	Element: sodium / calcium / iron Compound: fat / cholesterol / carbohydrate / fiber / sugar / vitamin A / vitamin C / protein	1 mark 1 mark
	(b)	Mixture It is made up of many <u>different elements and compounds</u> / <u>more than 2 substances</u> AND <u>Not chemically combined</u> together / <u>physically combined</u> together / that can be separated by physical means.	1 mark 1 mark
B5	(a)	Water/Ethanol/Alcohol	1 mark
	(b)	Component P, R and S They only showed 1 spot/dot/dye OR They are only made of one compound/element. Reject 1 colour - Does not have another samples/dyes	1 mark 1 mark
	(c)	<u>Q and S</u>	Both for 1 mark
	(d)	To prevent the solvent from <u>evaporating</u> . Reject: prevent substances from entering the set-up/disrupting the experiment	1 mark

B6	(a)	Ultraviolet ray R: UV, ultraviolet light	1 mark
	(b)	<u>Visible</u> light Reject: light	1 mark
	(c)	Infrared Reject: infrared light/ray	1 mark
B7	(a)	Position must be marked with a dot. Must be labelled with "I"	1 mark for correct position of I
	(b)		(i) 1 mark for dotted imaginary ray (ii) 1 mark for incident and reflected ray with correct arrow -1m for: • Only one ray drawn • No ruler
	(c)	Laterally inverted / Same size as object / Upright / Virtual / Object distance to mirror is equal to image distance to mirror Reject: • Same size. • Same distance. • Fake/not real	1 mark for each answer Any two answers

B8	(a)	Allows for expansion of bridge on a hot day / contraction of bridge on cold day Reject: expansion of joint which prevent bridge from cracking/breaking/buckling/breaking/ leave gap so bridge can expand safely Reject: • bridge will be bumpy/not smooth • bridge will spoil/be damaged	1 mark 1 mark
	(b)	mass: remains the same volume: increase density: decrease	1 mark for 2 correct 2 marks for all 3 correct
B9	(a)	They are same type of cells They perform same specific function R: Similar	1 mark 1 mark
	(b)	It has a cell wall/chloroplasts Reject: • chlorophyll • regular shape fixed shape (without mention of cell wall)	1 mark
	(c)	Plant cell has chloroplasts but animal cell doesn't have a chloroplasts or Plant cell has a large central vacuole but animal cell has many smaller vacuoles or Plant cell has a cell wall but animal cell does not have a cell wall. Answer has to show comparison (animal vs plant)	1 mark No marks awarded if same point is raised in (b)

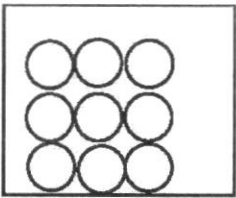
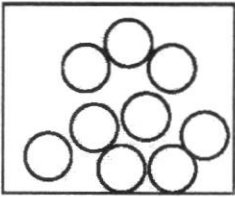
B10	(a)			Correct heading with table-1 mark • Closed table with no additional columns/rows • Reject: mass/charge Relative mass - 1mark Relative charge- 1mark
			Relative mass	
		Proton	1	
		Electron	1/1840 or 0.0005	
		Neutron	1	0
	(b)	Atoms contain same number of protons (positively charged) and electrons (negatively charged). Reject: equal/same protons and neutrons Hence the net <u>charge</u> of an atom is <u>zero</u> . It is said to be electrically neutral. Accept if answer references the Accepting /cancelling out of charges		1 mark 1 mark

Section C

C1	(a)	Experiment C. The temperature <u>of the water solvent</u> is high than in other experiments. Reject if water solvent is not mentioned The suger has the largesr surface area to volume ratio / smallest particle size	1 mark 1 mark 1 mark
	(b)	He is wrong. Solubility of a solute does not depend on the rate of stirring. OR Stirring <u>only</u> speeds up rate of dissolving/decreases the time needed to dissolve.	1 mark 1 mark

	(c)	Solutions	Suspensions	Any 3 correct comparisons- 3 marks Reject if "solute" is used to describe suspension
		homogeneous	heterogeneous (wrong spelling "heterogeneous" common)	
		light to pass through <u>easily/fully</u> (reject clear vs unclear) accepted transparent	light does not pass through <u>easily/fully</u>	
		leaves no residue on <u>filtration</u>	leaves residue on <u>filtration</u>	
		No separation of <u>solute</u> and solvent when left to stand	Separation of <u>insoluble substance</u> and solvent when left to stand	
	(d)	(i) simple distillation		1 mark
		(ii) filtration		1 mark
C2	(a)			1 mark – 2 correctly labelled organelles 1 mark – 2 correctly labelled organelles 1 mark – accurate shape and size of cell and organelles 1 mark – no sketching/shading Maximum 1m if drawing is completely unlabelled. -1m if labels are not written (used the printed labels)

(b)	structure		function		1 mark
	<i>nucleus</i>		Controls all activities within the cell OR Contains DNA/genetic information that is passed down to the next generation		
	cytoplasm		Site where most of the chemical reactions occur		
(c)	Benefit: invention of antibiotic to treat illness (accept other the reasonable answers)				1 mark
	Harm: invention of atomic bomb that kills people (accept other reasonable answers)				1 mark
	Reject if:				
	- specific example is not provided)e.g 'technology allows for.....) - harm benefit is not states (e,g " atomic bomb)				
	data collected		qualitative	quantitative	1 mark 2 correct 2 marks for all 3 correct
	Volume of pond water collected is 10 cm ³ .			✓	
	The cell observed is green with slight yellow tint.		✓		
	The pond water has an unplesant smell.		✓		

C3	(a)	Malleable / shiny <i>Accept if the properties are described accurately</i>	1 mark
	(b)	(i)  1000°C  1200°C	1 mark each No marks awarded if: • shape and size of circles are not the same • arrangement is wrong • overlapping of circles • circle template is not used -1 overall if less than 9 circles are drawn
		(ii) No. There is <u>no/little space</u> as particles are closely packed to one another.	1 mark 1 mark
		(iii) Particles are <u>far apart</u> and arranged in a <u>disorderly</u> manner. Reject not closely packed/not close/not neat Particles move <u>rapidly/quickly</u> in <u>random</u> directions.	1 mark 1 mark Must have all underlined keywords to be awarded the mark
	(c)	(i) Density = $36.5 / 3.1 = 11.8 \text{ g/cm}^3$ reject if not in 3s.f.	1 mark
		(ii) No because density is lower than density of pure gold. <i>Accept if comparison is made between density of pure gold and gold token.</i> Reject if answer just states the density of pure gold. Reject: heavier	1 mark