SERANGOON SECONDARY SCHOOL
END-OF-YEAR EXAMINATION
SECONDARY 1 EXPRESS

CANDIDATE NAME		CLASS	
INDEX NUMBER			

SCIENCE

(Section A and Section B)

12 October 2022
Section A, B and C: 2 hours

Candidates answer on the Answer Sheet for Section A and on the Question Paper for Section B.

Setters:

READ THESE INSTRUCTIONS FIRST

Write your index number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staplers, paper clips, glue or correction fluid.
Any rough working should be done in this booklet.
A copy of the Periodic Table is printed on the last page.
The use of an approved scientific calculator is expected, where appropriate.
You may lose marks if you do not show your working or if you do not use appropriate units.

Section A
Read the instructions on the Answer Sheet very carefully.
Write your name, class and index number on the Answer Sheet in the spaces provided unless this has been done for you.

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 separate Answer Sheet. Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

Section B
Answer **all** questions.
Write your answers in the spaces provided on the question paper.

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

For examiner's use	
Section A	30
Section B	40
Total	70

This question paper consists of **19** printed pages, including this cover page.

Section A Multiple Choice Questions [30 marks]

Answer **all** questions in the separate multiple choice answer sheet.

A1 The short passage below writes about Stephen Hawking.

"Stephen Hawking, one of the greatest theoretical physicists of our time, passed away on 14 March 2018. Despite suffering from a motor neurone disease that paralysed him over the decades, he continued to work on his research and make ground-breaking contributions on relativity and cosmology."

With reference to the passage above, which scientific attitude is best demonstrated by Stephen Hawking in the passage above?

A curiosity
B innovation
C integrity
D perseverance

A2 Which statements are true?

I Advancements in science are always beneficial to society.
II Science is the study of our physical world.
III Scientific knowledge is derived from observations.
IV We use instruments to help us make accurate measurements.

A **I** and **II** only
B **III** and **IV** only
C **II**, **III** and **IV** only
D all of the above

A3 Which is a disadvantage of advancement in technology?

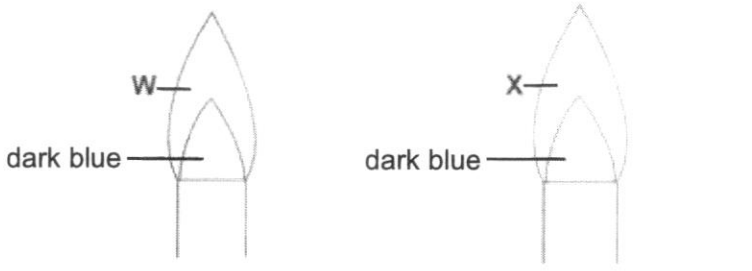
A Emissions from vehicles cause air pollution.
B Internet allows us to share information, personal ideas and thoughts.
C Medicines such as antibiotics help to cure diseases.
D Mobile phones give us the convenience of communicating anytime and anywhere.

A4 Scientists have discovered a new element and the following hazard symbols were labelled on its container.

This means that the new element is _____.

A biohazard and radioactive
B flammable and corrosive
C flammable and radioactive
D poisonous and corrosive

A5 The air-hole of a Bunsen burner can be opened or closed to obtain two types of flame. The colours of the flame are labelled in the diagram below.



flame of a Bunsen burner with the air-hole **opened**

flame of a Bunsen burner with the air-hole **closed**

Which option correctly states the colours of **W** and **X**?

	W	X
A	blue	blue
B	blue	orange
C	orange	blue
D	orange	orange

A6 Scratch tests are carried out for four metals - bronze, zinc, iron and titanium.

In a scratch test, when metal **X** is used to scratch metal **Y** and if a scratch mark is left on metal **Y**, a tick '✓' is indicated in the box. If there is no scratch mark on metal **Y**, a cross '×' is indicated in the box.

The table below shows the results of the scratch tests which can be used to determine the order of hardness of the four metals.

X \ Y	bronze	zinc	iron	titanium
bronze		✓	×	×
zinc	×		×	×
iron	✓	✓		×
titanium	✓	✓	✓	

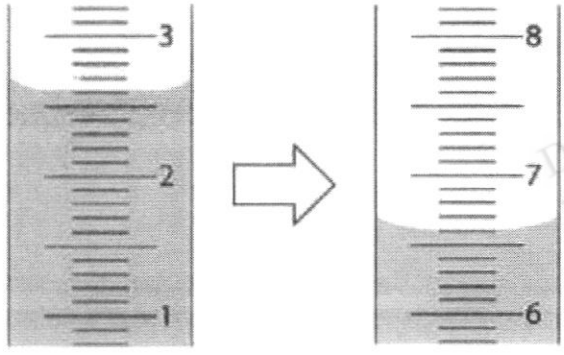
Which arrangement of the four metals, in **increasing** hardness, is correct?

A titanium, iron, bronze, zinc
B titanium, zinc, iron, bronze
C zinc, bronze, iron, titanium
D zinc, iron, bronze, titanium

A7 Tyres are made of _____ as it is _____ and can withstand high temperature and friction.

A metal, ductile
B metal, malleable
C plastic, less dense than water
D rubber, elastic

A8 To measure the volume of a ring, four students used a measuring cylinder filled with some water. The diagram below shows the readings before and after the ring was placed in the measuring cylinder.



before the ring was added after the ring was added

The students recorded their readings in a table. Which student, **A**, **B**, **C** or **D**, is correct?

	initial volume / cm^3	final volume / cm^3	volume of the ring / cm^3
A	2.1	6.1	4.0
B	2.6	6.6	4.0
C	2.8	7.2	4.4
D	3.4	7.5	4.1

A9 Which instrument is used for measuring mass?

A electronic balance
B measuring cylinder
C spring balance
D vernier caliper

A10 What are the SI units for length and mass respectively?

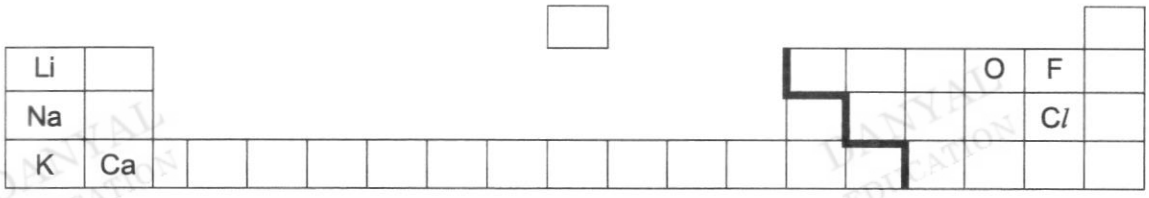
	length	mass
A	centimetre	kilogram
B	kilometre	gram
C	metre	kilogram
D	millimetre	gram

A11 Sodium chloride (NaC*l*), commonly known as table salt, exists as white crystals.

Which statement is true about sodium chloride?

A It cannot be broken down by physical methods.
B It has similar properties as sodium and chlorine.
C It is a mixture made up of two different elements.
D There is no fixed proportion of the elements it is made up of.

A12 The diagram below shows some elements in the Periodic Table.



Which statement is correct?

A Lithium, sodium and potassium are in the same group.
B Oxygen, fluorine and chlorine have similar chemical properties.
C Potassium is a non-metal whereas oxygen is a metal.
D Potassium, calcium and chlorine are in the same period.

A13 Which substance is **not** made up of two or more elements combined in a fixed proportion by mass?

A carbon dioxide gas
B oxygen gas
C salt
D water

A14 Emma wants to dissolve some sugar in her tea as quickly as possible.

Which method will **not** help her do so?

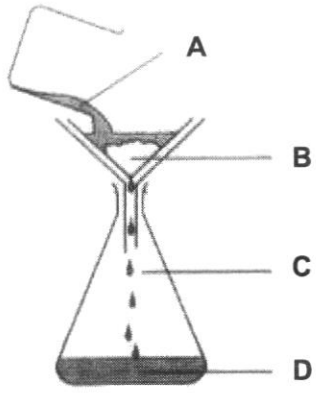
A adding crushed sugar instead of rock sugar
B heating her tea up
C stirring her tea more quickly
D using a bigger cup for her tea

A15 Which row shows the correct example of a solution and a suspension?

	solution	suspension
A	antibiotics	orange juice
B	orange juice	drain water
C	perfume	salt water
D	soft drink	antibiotics

A16 The diagram below shows the process of filtration.

At which point **A**, **B**, **C** or **D**, is the residue of the filtration?



A17 A sugar solution is being heated to obtain a saturated solution which is left to cool gradually.

Why is crystallisation used instead of evaporation to dryness?

A Sugar is not heat-stable and will decompose upon strong heating.
B Sugar solution has a higher boiling point than pure water.
C Sugar solution is a mixture.
D The container will be damaged if sugar solution is heated to dryness.

A18 Some iron filings and sulfur powder are accidentally mixed with tap water.

Which row shows the correct steps to separate the three substances?

	step 1	step 2
A	filtration	magnetic attraction
B	paper chromatography	filtration
C	simple distillation	filtration
D	sublimation	paper chromatography

A19 The diagram below shows a ray of light reflected in a plane mirror.

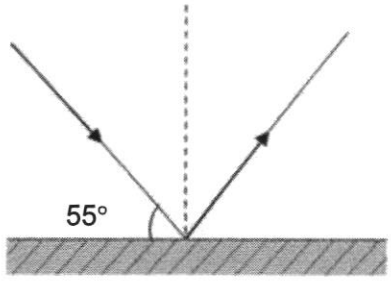
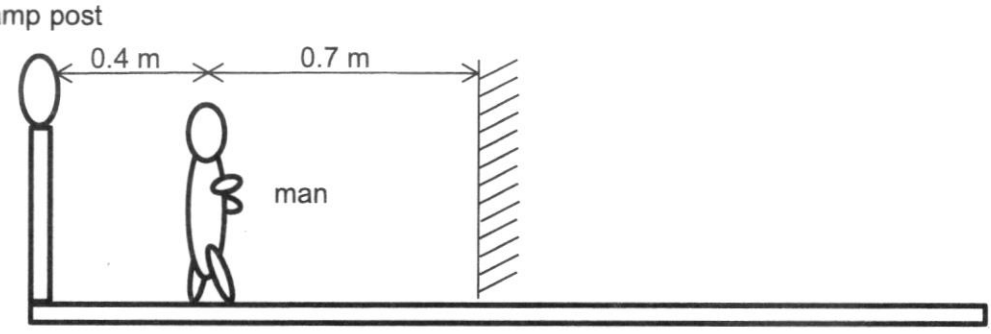


Diagram is not drawn to scale

The angle of reflection is _____.

A 25° **B** 35° **C** 55 ° **D** 65°

A20 A man is standing at a distance of 0.7 m in front of a vertical plane mirror as shown in the diagram below. A lamp post is located behind him at a distance of 0.4 m.



How far would the image of the lamp post appear to the man?

A 0.4m **B** 0.7m **C** 1.1m **D** 1.8m

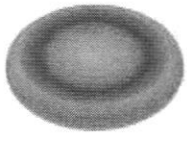
A21 Which option is a use of concave mirror?

A dentist's mirror
B mirror used in periscope
C rear view mirror in cars
D shop security mirror

A22 Which row correctly describe how speed of light changes when it travels from one transparent medium to another?

	medium	change in speed of light
A	air to glass	speeds up
B	air to water	speeds up
C	glass to air	slows down
D	water to air	speeds up

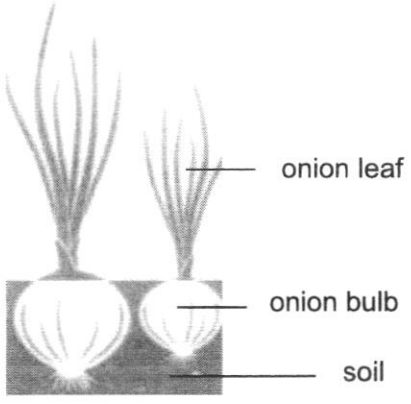
A23 The diagram below shows a red blood cell.



Which statement best explains how being biconcave in shape helps the cell to carry out its function effectively?

A To contain more haemoglobin to transport more oxygen.
B To fight virus more effectively.
C To increase surface area to increase rate of absorption of oxygen.
D To squeeze through thin blood vessels.

A24 The diagram below shows an onion plant with the leaves above ground while the onion bulb underground.



Which organelle is present in the cells of the onion leaf but not in the cells of the onion bulb?

A cell wall
B chloroplast
C large central vacuole
D nucleus

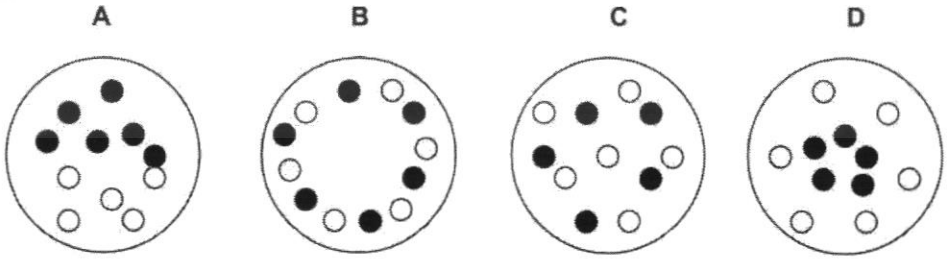
A25 Chromosomes are thread-like structures which carry heredity information of the organism.

In which organelle of the cells can chromosomes be found?

A cell membrane
B cytoplasm
C nucleus
D vacuoles

A26 Which diagram shows the arrangement of helium and hydrogen gas particles inside a balloon?

key
● helium particle
○ hydrogen particle



A27 Which statement shows that particles are in constant random motion?

A Gas do not have definite volume and can be compressed.
B Liquid and gas do not have fixed shape and takes the shape of the container.
C Pure substances have definite melting and boiling point.
D When a bottle of perfume is opened, the smell spreads quickly to all parts of the room.

A28 A solid substance **Z** was heated from room temperature to 90 °C. It has not melted.

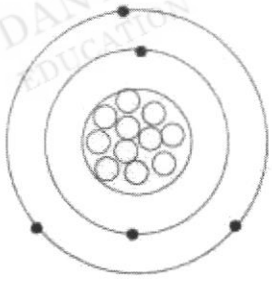
Which statement correctly describes what happens to substance **Z**?

A The particles of substance **Z** gain energy and slide past one another faster.
B The particles of substance **Z** gain energy and move at high speed.
C The particles of substance **Z** gain energy and increase in size.
D The particles of substance **Z** gain energy and vibrate faster.

A29 Which option shows the correct charges of an electron, neutron and proton?

	electron	neutron	proton
A	negative	neutral	positive
B	negative	positive	neutral
C	neutral	negative	positive
D	positive	neutral	negative

A30 The diagram below shows an atom.



How many neutrons does the atom have?

A 5
B 6
C 11
D 16

END OF SECTION A

Section B Structured Questions [40 marks]

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

B1 Fig. B1.1 shows a set-up to obtain water from sea water.

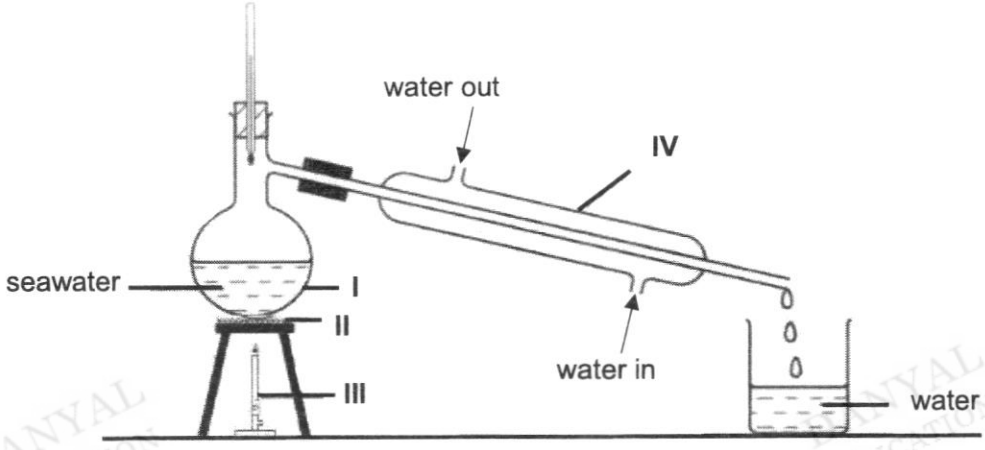


Fig. B1.1

(a) Name the apparatus labelled in the figure.

I ..... [1]

II ..... [1]

III ..... [1]

IV ..... [1]

(b) Should a luminous flame or non-luminous flame be used during the heating? Explain.

.....

..... [2]

B2 Laura and Sally measured their heart rates in beats per minute (bpm) after drinking two brands of fizzy drinks. Both had the same resting heart rate (60 bpm) just before they had the drinks.

Table B2.1 shows Laura's and Sally's heart rates after consuming brands **X** and **Y** fizzy drinks.

brand of fizzy drink	Laura's heart rate (bpm)	Sally's heart rate (bpm)
X	75	63
Y	110	98

Table B2.1

(a) Suggest the hypothesis that Laura and Sally are testing out.

.....

..... [1]

(b) State the independent variable in this experiment.

..... [1]

(c) Name one variable that should be kept constant.

..... [1]

(d) Explain why this cannot be a fair experiment even with the variable in **(c)** being kept constant.

.....

..... [1]

B3 Fig. B3.1 shows how the utensils are set up for one seat at a restaurant.

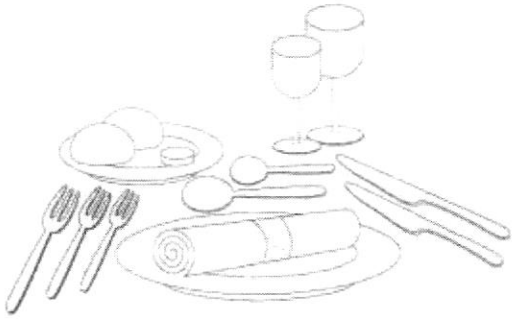


Fig. B3.1

Name the type of material (metal, plastic, glass, ceramics or fibres) that is usually used to make the items below.

State the reason for your choice of material using physical properties of matter.

(a) cutlery (for example, knife)

material: .....

reason: ..... [1]

(b) plate

material: .....

reason: ..... [1]

(c) napkin

material: .....

reason: ..... [1]

B4 **(a)** State one characteristic of the elements

(i) in the same group,

.....

..... [1]

(ii) across the same period.

.....

..... [1]

(b) Stainless steel is an alloy which is made mainly of iron and may contain other elements like chromium (12–14%), nickel (less than 2%), molybdenum (0.2–1%), and carbon (about 0.1–1%).

(i) State the chemical symbols of the elements, other than iron, found in stainless steel.

..... [1]

(ii) Use the information above to explain why stainless steel is a mixture.

.....

..... [1]

(iii) Describe one physical property of a mixture.

.....

..... [1]

B5 In an experiment, food colourings used in five different sweets, **A**, **B**, **C**, and **D**, were tested for the presence of safe food colourings, **1**, **2** and **3**. Paper chromatography was used in the experiment, with water as the solvent.

Fig. B5.1 shows the chromatogram obtained.

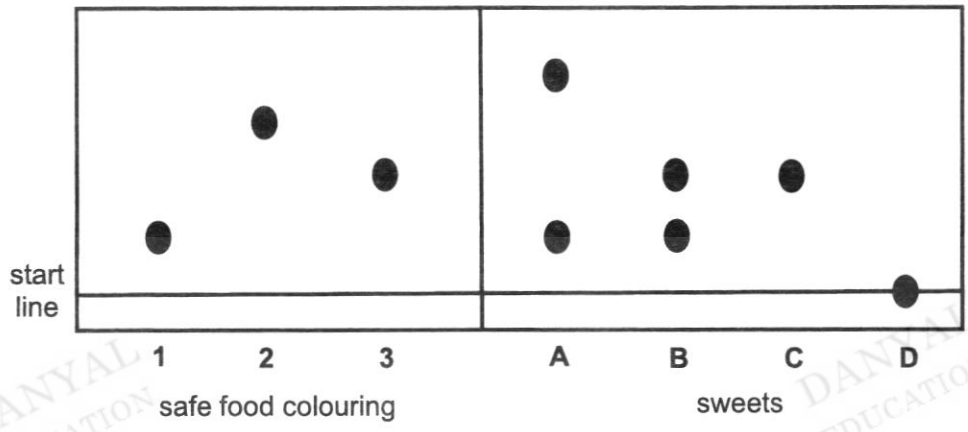


Fig B5.1

(a) Why must the start line be drawn with a pencil?

..... [1]

(b) Which sweet, **A**, **B**, **C** or **D**, is pure? Explain your answer.

.....

..... [2]

(c) Is sweet **A** safe for children to eat? Give a reason for your answer.

.....

..... [2]

B6 **(a)** Fig. B6.1 shows a light ray that is passing from material **P** to material **Q**.

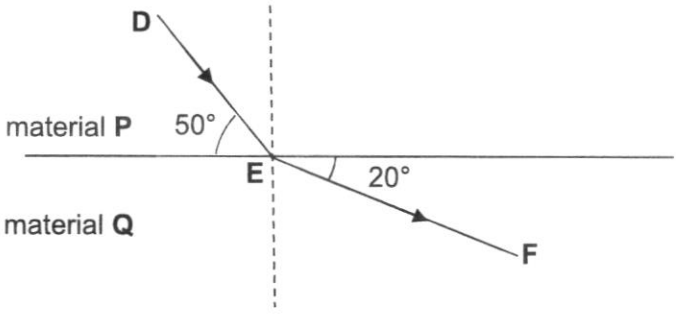


Fig. B6.1

(i) Determine the angle of refraction.

..... [1]

(ii) Explain why the light ray **EF** behaves in the manner shown in the diagram.

.....

..... [1]

(b) To curb the spread of Covid-19 virus, there has been an increased use of electromagnetic radiation to sterilize rooms.

(i) State the type of electromagnetic radiation that is used to sterilize the rooms.

..... [1]

(ii) Give one harmful health effect of the electromagnetic radiation in **(b)(i)**.

..... [1]

B7 Fig. B7.1 shows a specialised cell.

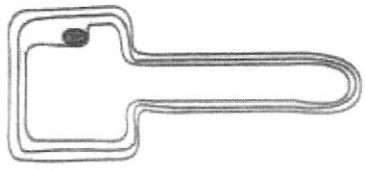


Fig. B7.1

(a) What is the function of this specialised cell?

.....

..... [1]

(b) **(i)** State one adaption that the cell has that help it to carry out its function.

.....

..... [1]

(ii) Explain how the adaption in **(b)(i)** supports its function.

.....

..... [1]

B8 Fig. B8.1 shows how the sodium atoms are arranged at different temperatures.

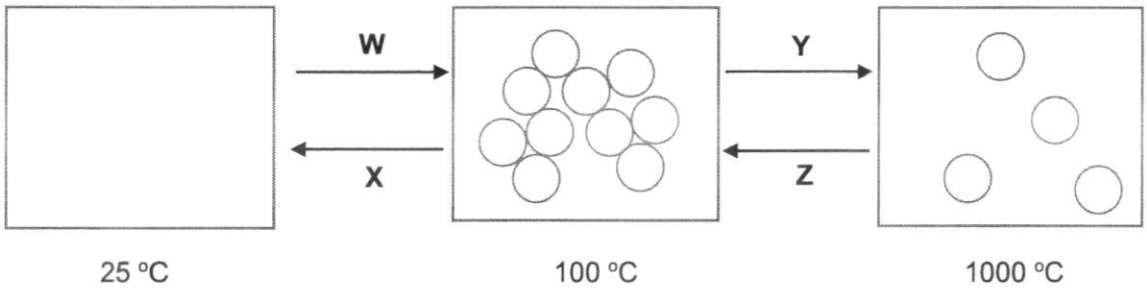


Fig. B8.1

Sodium is an element that can be found in the Periodic Table.
The melting point of sodium is 98 °C.

(a) **(i)** Draw the arrangement of sodium atoms at 25 °C in the box. [1]

(ii) State the process that sodium is undergoing at **X**.

..... [1]

(b) Explain, in terms of Particulate Nature of Matter, why liquids and gases can take the shape of containers while solids cannot.

.....

.....

..... [2]

(c) Fig B8.2 shows the movement of particles of a substance in a sealed container over time.

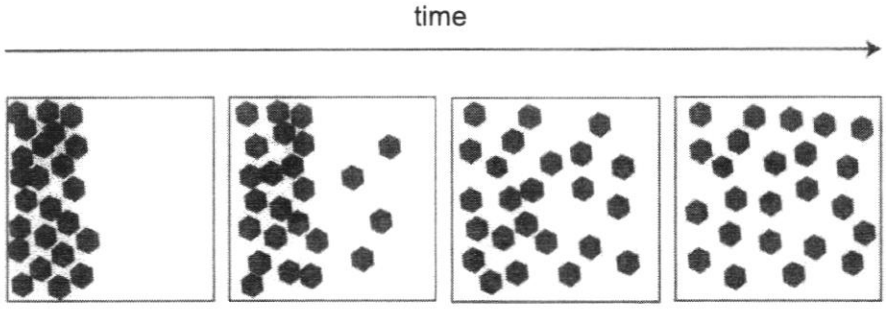


Fig. B8.2

(i) State the process in Fig. B8.2.

..... [1]

(ii) Describe the movement of the particles in Fig. B8.2.

.....

..... [1]

B9 Table B9.1 shows the information of various particles.

particle	number of protons	number of electrons	mass number	number of neutrons
M	17	17		18
N	17	17	36	19
O		18	40	22
P	16	17	32	

Table B9.1

(a) Complete Table B9.1 by filling in the blanks. [1]

(b) Which two particles are isotopes of the same element? Use Table B9.1 to explain your answer.

.....

.....

..... [2]

(c) Draw the electronic structure of atom **M** in the space below. [1]

END OF SECTION B

SERANGOON SECONDARY SCHOOL
END-OF-YEAR EXAMINATION
SECONDARY 1 EXPRESS

CANDIDATE NAME		CLASS	
INDEX NUMBER			

SCIENCE
(Section C)

12 October 2022
Section A, B and C: 2 hours

Candidates answer on the Question Paper.

Setter:

READ THESE INSTRUCTIONS FIRST

Write your index number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staplers, paper clips, glue or correction fluid.
Any rough working should be done in this booklet.
A copy of the Periodic Table is printed on the last page.
The use of an approved scientific calculator is expected, where appropriate.
You may lose marks if you do not show your working or if you do not use appropriate units.

Section C
Answer **all** questions.
Write your answers in the spaces provided on the question paper.

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

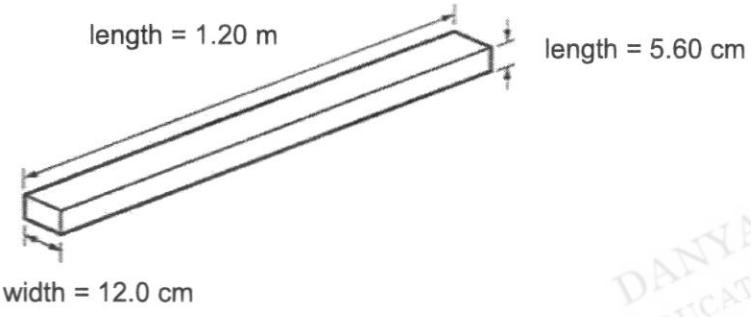
For examiner's use	
Section C	30

This question paper consists of **11** printed pages, including this cover page.

Section C: Free Response Questions [30 marks]
Answer **all** the questions in the spaces provided.

C1 Two items, and their dimensions, are shown in Fig. C1.1 below.

item 1: wooden plank



item 2: mug

Fig. C1.1

(a) Name suitable instruments to measure:

(i) the width of the plank, ...

(ii) the diameter of the mug. ..... [2]

The mass of the plank is 4.50 kg.
Joe was was asked to calculate the density of the plank to determine what type of wood was used to make the plank.

(b) Define 'density'.

..... [1]

(c) Convert the following quantities:

(i) 1.20 m to cm,

..... cm [1]

(ii) 4.50 kg to g.

..... g [1]

(d) Using your answer to **(c)(i)**, calculate the volume of the plank in cm^3.

volume of plank = ... cm^3 [1]

(e) Hence, calculate the density of the plank in g/cm^3.

density of plank = ... g/cm^3 [1]

(f) **Table C1.2** below shows the densities of five different types of wood.

type of wood	density (g/cm^3)
black ash	0.56
hackberry	0.62
madrone	0.74
persimmon	0.90
zebrawood	0.79

Table C1.2

(i) What type of wood is the plank most likely to be made of?

..... [1]

(ii) The wooden plank is placed in liquid pentane, which has a density of 0.625 g/cm^3. State and explain whether the plank would sink or float.

.....

.....

..... [2]

C2 In the early nineteenth century, John Dalton started to use symbols to represent elements and compounds. Fig. C2.1 shows the symbols that he used for the elements.

carbon	hydrogen	nitrogen	oxygen
			

Fig. C2.1: Dalton's element symbols

Fig. C2.2 shows formulas of some compounds.

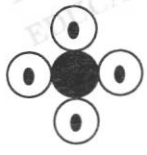
name of compound	correct formula	molecule of compound using Dalton's elements symbols
methane	CH_4	
carbon dioxide	CO_2	
water	H_2O	

Fig. C2.2: Dalton's formulas for some compounds

(a) Using Dalton's element symbols, the molecule of methane is drawn as shown above in Fig. C2.2. Draw the molecules of carbon dioxide and water in Fig. C2.2 using Dalton's element symbols. [2]

(b) Define the term 'compound'.

.....

..... [1]

(c) Fig. C2.3 shows Dalton's formula for another compound.

Fig. C2.3

Suggest the identity of the compound.

..... [1]

(d) Substance **X** and substance **Y** are diatomic molecules. Diatomic molecules are molecules formed by two atoms chemically combined together. A mixture containing substances **X** and **Y** is shown in Fig. C2.4.

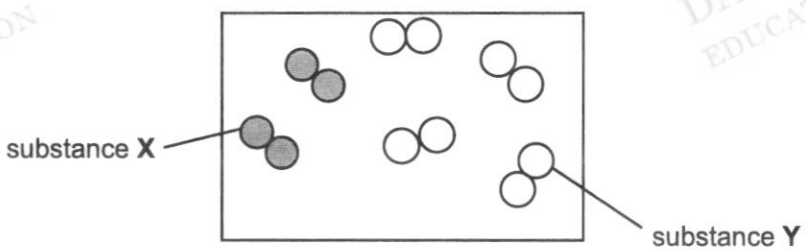


Fig. C2.4

Substance **Z** is a molecule made up by one atom of substance **X** chemically bonded with three atoms of substance **Y**.

Classify substance **X**, **Y** and **Z** as either an element, compound or mixture.

substance **X** .....

substance **Y** .....

substance **Z** ..... [3]

(e) A liquid mixture of substance **X** and **Y** is given. The boiling point of **X** is 100 °C and the boiling point of **Y** is 78 °C.

(i) State the separation technique that can be used to separate the two substances.

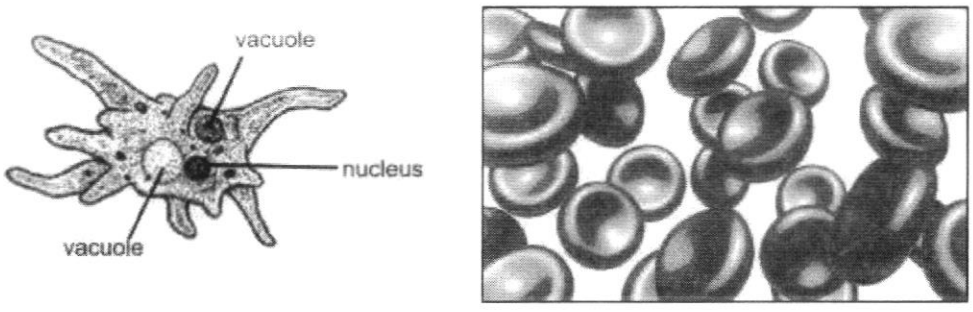
..... [1]

(ii) Describe how both substances can be obtained separately.

.....

..... [2]

C3 Fig. C3.1 shows an amoeba cell and red blood cells.



amoeba cell red blood cells

Fig. C3.1

(a) The amoeba is a unicellular organism.

State a difference between a unicellular organism and a multicellular organism.

.....

..... [1]

(b) State one feature that can be found in amoeba cell but not in red blood cell.

.....

..... [1]

(c) Suggest a reason why red blood cells can only survive for three months.

.....

..... [1]

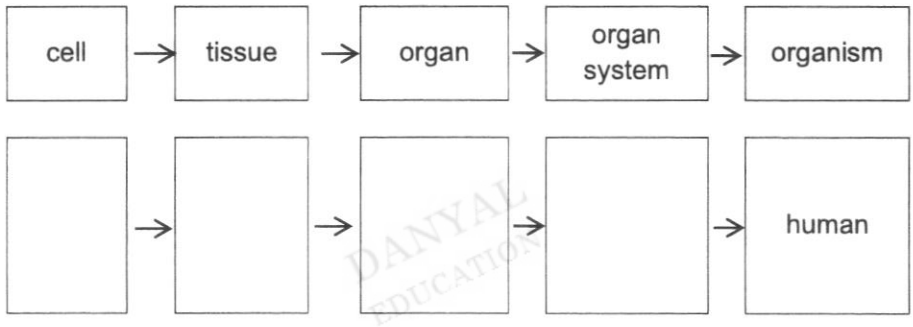
(d) The human nervous system is a network of cells that helps to send messages throughout the body. It helps to coordinate our senses and our actions.

Table C3.2 contains some information about the human nervous system.

The basic unit of the nervous system is called a neuron. Neurons are specialised cells that communicate through electrical signals. In the central nervous system, the neurons combine to form grey matter and white matter. They are mainly situated in the brain, spinal cord and other bones to help coordinate body movement.

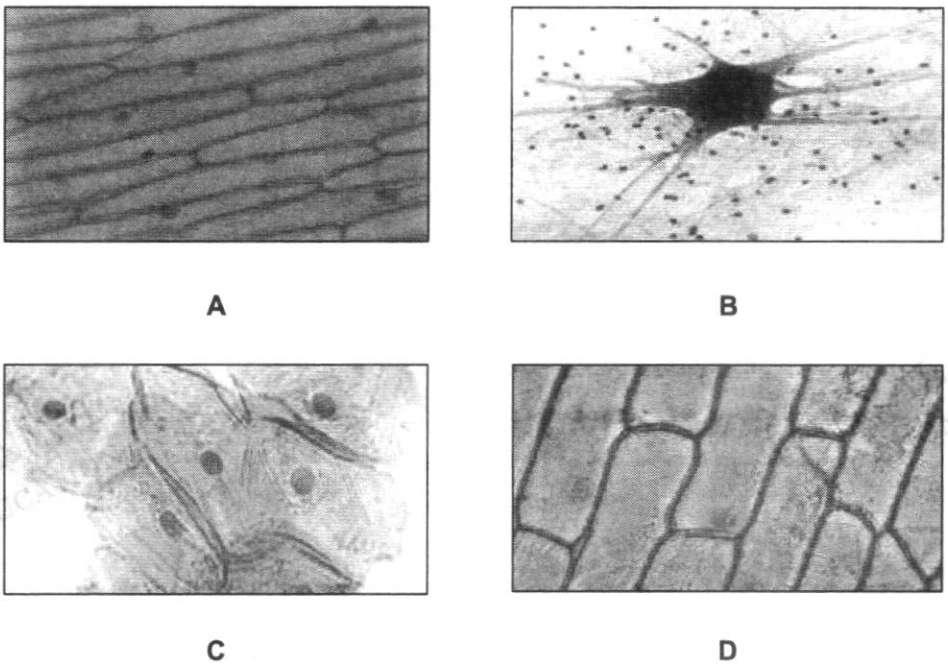
Table C3.2

Based on the passage, fill in each blank with a term from the passage to show an example of cell organisation in the human body.



[2]

(e) Fig. C3.3 shows the light micrograph images of four different cells.



A **B**

C **D**

Fig. C3.3

(i) Complete Table C3.4 by classifying the four light micrograph images **A**, **B**, **C** and **D** in Fig. C3.3 as a plant or animal cell.

plant cell	animal cell

Table C3.4 [2]

(ii) Based on Fig. C3.3, what is the feature that distinguishes between plant cell and animal cell?

..... [1]

(iii) Identify one structure in an animal cell and describe its function.

structure: .....

function: ..... [2]

END OF PAPER

SSS 2022 1E End-of-year Examination Marking Scheme

Section A

1	2	3	4	5	6	7	8	9	10
D	C	A	B	B	C	D	B	A	C

11	12	13	14	15	16	17	18	19	20
A	A	B	D	D	B	A	A	B	D

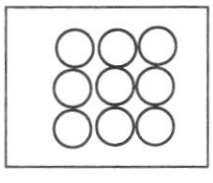
21	22	23	24	25	26	27	28	29	30
A	D	C	B	C	C	D	D	A	B

Section B

B1	**(a)**	**I** distillation / round botton flash **II** wire gauze **III** bunsen burner **IV** condenser	1 1 1 1
	(b)	Non-lum inous flame The non-luminous flame hotter / steady flame higher temperature / heat up faster Accept: - produce little to no soot (not the main reason for using non-luminous flame for heating) stable flame (not a main descriptor for flame)	1 1
B2	**(a)**	- The hypothesis is that drinking different brands of fizzy drinks has varying effects on their / humans heart rates. - Drinking different brands of frizzy drinks increase heart rates of humans. - Brand X/Y increases the heart rates. - Brand Y increases heart rates more than Brand X. Reject: - Aim of experiment eg find out if drinking fizzy drinks will increase heart rate	1
	(b)	Brand of fizzy drink Reject: type of drink	1

	(c)	Any one of the following: - The same volume of fizzy drink must be drunk - Drinking speed must be kept constant - Time taken to finish the drink	1
	(d)	This cannot be a fair experiment as the effects of the fizzy drink on heart rate is very much dependent on the individual himself / herself (e.g. bodyweight, metabolism, type of food eaten beforehand etc.) Accept: - The hearts of the two persons will react differently to the fizzy drinks. - There are two different hearts / individual in the experiment - The volume of fizzy drink drunk by the two persons might be different - The speed of drinking the fizzy drinks might have different effects of the heart rates. Reject: - Answers that explains wht variable should be kept constant in (c)	1
B3	(a)	Metal - It is hard so it can cut food Metal - strong / does not break easily Plastic - poor conductor of heat Plastic - stong / does not break easily Reject: Metal - durable Metal - god conductor of heat Metal - brittle / not brittle Metai - it is stong and cuts food easily. Ceramics / glass - poor conductor of heat / stong - any reasons without reference to physical properties	1
	(b)	ceramic / plastic / glass - poor conductor of heat / does not gain heat easily ceramics / glass - hard / does not scratch easily plastic / metal - stong / does not break easily Reject: plastic - hard ceramics / glass - strong / does not break easily	1
	(c)	fibres / cloth / paper - can absorb water / soft / flexible / light weight Reject: - not waterproof - will not scratch face	1

		- absorb substances - smooth		
B4	(a)	(i)	- They have similar chemical properties. - They have the same no of valence electrons. - They form ions of the same charge.	1
		(ii)	- Their properties gradually change from those of metals to those of non-metals moving from left to right across the period. - They have the same number of electron shells. Reject: - increasing proton number / atomic number	1
	(b)	(i)	Cr, Mo, Ni, C (one mark for all 4 elements)	1
		(ii)	The components in steel are not combined in fixed ratio. Stainless steel is an alloy that contains iron and other elements / different elements physically com bined together / not chemically combined together - Stainless steel is made up of more then one element physically combined together / not chemically combined to gether.	1
		(iii)	Either one of the following - it melts or boils over a range of term peratures - it will have the physical properties of its components -Can be separated by physical means	1
B6	(a)		Either one of the following - pencil mark is insoluble in the solvent, and will not interfere with the results. - pencil mark will not dissolve and interfere with the results. -pensil mark will not smudge and interfere with the results. Reject: - explanation on the use of pen ink	1
	(b)		C. It only has one component / substance / dot / spot.	1 1
	(c)		No. There is an unknown substance / spot / dot in sweet A's chromatogram which is not proven to be safe for consumption.	1 1

B6	**(a)**	**(i)**	70 °	1
		(ii)	As light changes its speed due to a difference in the optical densities of the medium P & Q.	1
	(b)	**(i)**	Ultraviolet radiation	1
		(ii)	It can **harm our eyes / causes skin cancer**. Reject: sunburn / suntan / harm our body	1
B7	**(a)**	The root hair cell **absorbs water and mineral salts from the soil**.		1
	(b)	**(i)**	It has a **long and narrow extension**.	1
		(ii)	It **increases the surface area for faster absorption** of water and mineral salts from the soil.	1
B8	**(a)**	**(i)**		1
		(ii)	Freezing	1
	(b)	For liquids and gases, the particles can **move** to take up the shapes of the containers. For solids, the particles are held in **fixed positions** and cannot move to take up the shapes of the containers.		1 1
	(c)	**(i)**	Diffusion	1
		(ii)	It is the movement of particles from a region of high concentration to a region of low concentration.	1

B9 (a)

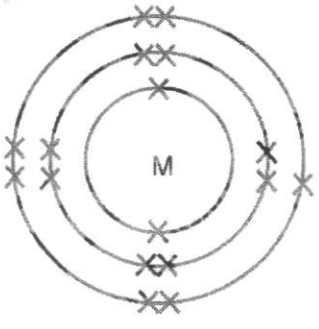
particle	number of protons	number of electrons	mass number	number of neutrons
M	17	17	35	18
N	17	17	36	19
O	18	18	40	22
P	16	17	32	16

1m for 3 answers — 1

(b) **Particle M and N** — 1

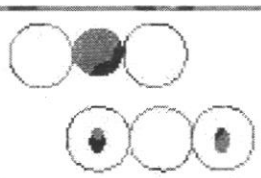
Because particle M and N have the same number of **protons of 17** but different number of neutrons of 18 and 19 respectively. — 1

(c)



1

Section C

C1	(a)	(i)	metre rule / ruler / measuring tape	1
		(ii)	Vernier callipers / digital callipers	1
	(b)	Mass per unit volume / Density = $\frac{\text{mass}}{\text{volume}}$		1
	(c)	(i)	1.20 m = 120 cm	1
		(ii)	4.50 kg = 4500 g	1
	(d)	Volume of box = $l \times b \times h$ $= 120 \times 12 \times 5.6$ $= 8064\ cm^3$ ECF awarded for wrong conversion in **(c)(i)** & **(ii)**		1
	(e)	density = mass/volume $= 4500 \div 8064$ $= 0.558\ g/cm^3$ ECF awarded for wrong conversion in **(c)(ii)** OR wrong volume in **(d)**		1
	(f)	(i)	Black ash	1
		(ii)	The box **float.** The **density** of the box **is lower than liquid pentane.**	1 1
C2	(a)	CO_2 H_2O 		1 1
	(b)	Compound is made up of **two or more atoms chemically combined** together.		1
	(c)	Nitrogen monoxide / Nitrogen Oxide / NO		1
	(d)	Substance X: element Substance Y: element Substance Z: compound		1 1 1
	(e)	(i)	Fractional distillation	1

<table>
<tr><td></td><td></td><td>(ii)</td><td>When the thermometer reading is at 78 °C, substance Y will be collected as distillate.
When the thermometer reading is at 100 °C, substance X will be collected as distillate.</td><td>1

1</td></tr>
<tr><td>C3</td><td>(a)</td><td colspan="2">Unicellular organism is an organism that consist of only one cell.
Multicelluar organisms are organisms that consist of many different types of cells.</td><td>1</td></tr>
<tr><td></td><td>(b)</td><td colspan="2">It has nucleus / vacuoles.</td><td>1</td></tr>
<tr><td></td><td>(c)</td><td colspan="2">It does not have a nucleus that controls activities of the cell.</td><td>1</td></tr>
<tr><td></td><td>(d)</td><td colspan="2">neuron → grey matter or white matter → brain or spinal cord or bones → nervous system
2 correct 1m; max 2m</td><td>2</td></tr>
<tr><td></td><td>(f)</td><td>(i)</td><td><table><tr><td>Plant cell</td><td>Animal cell</td></tr><tr><td>A</td><td>B</td></tr><tr><td>D</td><td>C</td></tr></table>
All correct 2m
2 correct 1m; max 2m</td><td>2</td></tr>
<tr><td></td><td></td><td>(ii)</td><td>Plant cells have cell wall while animal cell does not.</td><td>1</td></tr>
<tr><td></td><td></td><td>(iii)</td><td>Nucleus: Control all activities of cell

Cell membrane: controls substances moving in and out of the cell

Cytoplasm: jelly-like substance where chemical reactions take place</td><td>2</td></tr>
</table>