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Fuchun Secondary School
Secondary 1 Normal Academic EOY 2016

Section A [30 marks]

Answer **all** questions in this section.

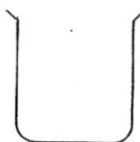
Shade your answers in the Multiple Choice Answer Sheet provided.

- 1 A reagent bottle has the following sign on it.



What safety **precaution** should Yassin take when using this chemical?

- A He should not touch the bottle.
 - B He should wear gloves when handling the bottle of chemical.
 - C He should not heat the liquid directly over a flame.
 - D He should store it near a flame.
- 2 Which flame should we use to heat a substance strongly?
- A luminous flame
 - B non-luminous flame
 - C orange flame
 - D sooty flame
- 3 Xin Ru did the following steps when she was conducting an experiment in a laboratory. Which of the steps is **incorrect**?
- A She put on safety goggles when she wanted to heat an unknown chemical.
 - B She poured back some unused chemicals back into its original bottle.
 - C She wore gloves before she handled chemicals on her table.
 - D She washed her hands thoroughly after she had conducted the experiment.
- 4 The diagram below shows the cross-sectional diagram for a laboratory apparatus.



What does the symbol represent?

- A beaker
- B filter funnel
- C measuring cylinder
- D test tube

- 5 A teacher carried out her first lesson in a class. The teacher asked her students the following questions about the study of Science.

- I. Science is the study of the natural world.
- II. Science is the study of the physical world.
- III. Science is the study of the supernatural world.

Which statements represent the study of science?

- A I and II only
- B I and III only
- C II and III only
- D all of the above

- 6 Which of the following shows an example of the abuse of Science?

- A The invention of new materials to make cloths.
- B The creation of new programming codes.
- C The making of pure samples of harmful drugs for consumption.
- D The discovery of clean energy.

For question 7 and 8, refer to the table below.

The table below shows the data that Samuel collected for an experiment on falling objects.

mass of falling object (kg)	height from which object was released (m)	time taken to reach ground (s)

- 7 Which of the following statement(s) below could be the hypothesis that he tested?

- I. The greater the mass of an object, the longer the time it takes to fall to the ground.
- II. The lower the density of an object, the longer the time it takes to fall to the ground.
- III. The greater the mass of a falling object, the greater the distance it falls.

- A I only
- B II and III only
- C I and III only
- D all of the above

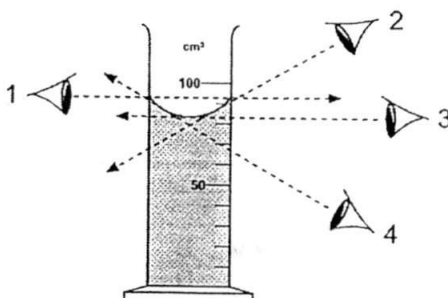
- 8 To improve the experiment, Samuel's teacher told him that he should ask himself more questions before carrying out the experiment.
Which of the following questions should Samuel have asked?

- A Should the release height be measured in centimetres (cm) instead of metres (m)?
- B How does the shape of the object affect the time taken to reach ground?
- C Should the mass of the object be measured using an electronic balance or beam balance?
- D Should the mass of the object be measured again after it reaches the ground?

- 9 What is the **smallest** length that can be measured by a pair of vernier calipers and a metre ruler respectively?

	Vernier calipers	metre ruler
A	0.1 mm	0.01cm
B	0.01cm	0.1cm
C	0.1cm	0.1cm
D	0.01cm	1.0cm

- 10 The diagram below shows a measuring cylinder containing water.
From which position will the **most** accurate reading of the volume of the water be made?



- A position 1
- B position 2
- C position 3
- D position 4

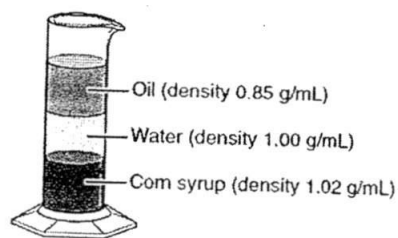
- 11 Terence wants to find out if his classmates with longer legs can run faster than those with shorter legs.
What measurement should he make to carry out his investigation?

- A The weight of his classmates and their running speed.
- B The height of his classmates and their running speed.
- C The gender of his classmates and their running speed.
- D The length of his classmates' legs and their running speed.

- 12 Students measured and recorded the density of four different liquids in the table below.

liquid	density (g/mL)
1	1.07
2	0.95
3	1.15
4	0.40

If the four liquids are poured into the measuring cylinder below, which liquid sample will **most** likely float on oil?

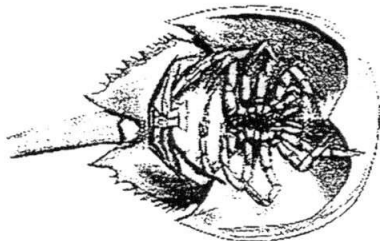


- A liquid 1
C liquid 3
- B liquid 2
D liquid 4
- 13 Which term is used to describe the amount of matter in an object?
- A volume
C weight
- B density
D mass
- 14 What is the SI unit for speed?
- A m/s
C m/min
- B cm/s
D km/hr
- 15 Electric wires are made from copper.
Which of the following is a physical property of copper?
- A It can be easily pulled without breaking.
B It is a liquid at room temperature.
C It is a poor conductor of electricity.
D It reacts readily with oxygen.

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- 16 Cooking utensils are always fitted with plastic handles.
Which property of plastics allows them for its use?
- A Plastics are good conductors of heat.
 - B Plastics are not strong.
 - C Plastics are poor conductors of heat.
 - D Plastics have a high density.
- 17 Which property of a substance indicates if it is a liquid or solid at room temperature?
- A melting point
 - B hardness
 - C flexibility
 - D solubility
- 18 Which of the following is **not** a physical change?
- A Plastic is heated and moulded to desired shapes.
 - B Glass allows light to pass through.
 - C Wood is placed on the surface of the water.
 - D A dead tree decomposed and released carbon dioxide.
- 19 What does biodiversity refer to?
- A the existence of different kinds of human races on earth
 - B the existence of different kinds of animals and plants on earth
 - C the existence of different kinds of animals on earth
 - D the existence of different kinds of plants on earth
- 20 Which of the following animals is **least** affected by the destruction of tropical rainforests?
- A Pangolin
 - B Orang Utan
 - C Paradise snake
 - D Giant Panda

- 21 What do horseshoe crabs and spiders have in common?



- A They are cold blooded.
B They live on land.
C They have four pairs of legs.
D They are venomous.
- 22 Which of the following groups consists of animals that have soft bodies and are protected by a shell?
- A snails , clams, crab
B tortoise, clams, whales
C clown fish, octopus, centipedes
D spider, snake, jelly fish
- 23 Which of the following are found in the Periodic Table?
- A elements
B compounds
C mixtures
D all of the above
- 24 How are elements classified?
- A metals or non-metals
B mixtures and solutions
C solutions and suspensions
D chemical formulae and symbols
- 25 Which of the following rows is **correct**?
- | | | |
|---|----------|---------------------------------|
| A | solvent | made up of solute and solution |
| B | solution | made up of solute and solvent |
| C | solution | made up of solute and solute |
| D | solute | made up of solvent and solution |

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- 26 Which of the following actions will **not** speed up the rate of dissolving of a sugar cube in a beaker of water?
- A Lower the temperature of water by adding ice.
 - B Stir continuously.
 - C Increase temperature of the water by heating.
 - D Crush the sugar cubes into small pieces and swirl the beaker.
- 27 Which of the following groups is arranged from basic to complex order of organisation in a multicellular organism?
- A cell → tissue → organ → system
 - B tissue → cell → system → organ
 - C system → organ → tissue → cell
 - D organ → system → cell → tissue
- 28 An amoeba has its nucleus removed. For 30 minutes, it continued to move and feed, but did not reproduce. A normal amoeba reproduced twice for the same period of time.
What conclusion can be drawn about the role of the nucleus in the amoeba?
- A The nucleus is necessary for cell growth.
 - B The nucleus is necessary for reproduction.
 - C The nucleus is the only place that contains DNA.
 - D The nucleus regulates the activity of the cell.
- 29 What is the function of chlorophyll?
- | | | | |
|---|----------------------|---|------------------------|
| A | absorbs light energy | B | absorbs carbon dioxide |
| C | absorbs heat energy | D | absorbs oxygen |
- 30 Which of the following has a large central vacuole?
- A onion
 - B cheek
 - C brain
 - D blood

End of Section A

Section B [40 marks]

Answer **all** questions.

Write your answers in the spaces provided.

- 1 Use the Periodic Table to help you answer the following questions about magnesium.

(a) Write the chemical symbol of magnesium.

..... [1]

(b) Which Group is magnesium in?

..... [1]

(c) List the **two** physical properties of magnesium.

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

(d) Explain your answer in part (c).

..... [1]

- 2 Fig.1 shows the dichotomous key of organisms in Kingdom Plantae. Use Fig.1 to answer the questions.

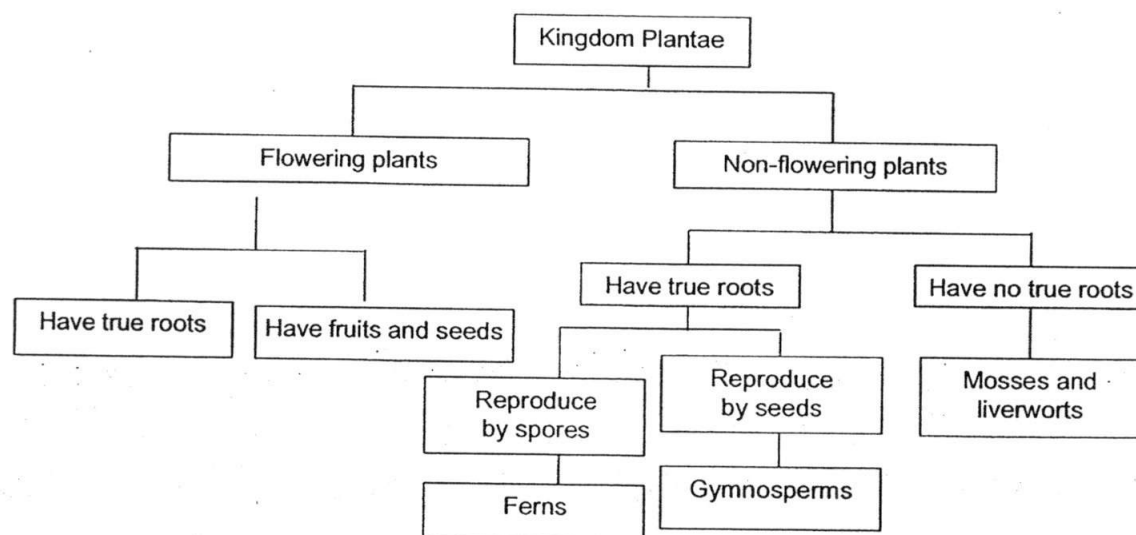


Fig. 1

(a) Identify a similarity between flowering plants and gymnosperms.

..... [1]

(b) For each of the following groups of plants, describe their characteristics.

(i) mosses and liverworts

.....
..... [1]

(ii) ferns

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

3 (a) Choose the **correct** material for the following objects. Fill in the blanks in the Fig. 2 with the options given below.

Cotton; Glass; Plastic; Metal

Object	Material
bottle	
jewellery	
clothing	
vase	

Fig. 2

[2]

(b) State **two** physical properties of plastic in 3(a).

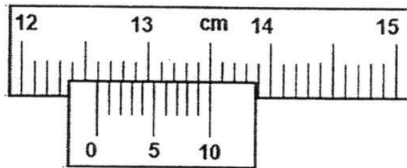
.....
..... [2]

(c) Suggest a reason why the study of physical properties of materials is important to us.

.....
..... [1]

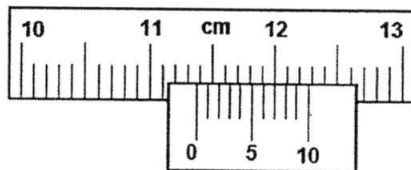
4 (a) Give the correct reading for each of the following.

(i)



..... cm [1]

(ii)



..... cm [1]

(b) Complete the Fig. 3. by filling in the blanks with the appropriate quantity measured and the appropriate SI unit for the quantity.

Apparatus	Quantity measured	SI unit
Electronic balance		
Digital stopwatch		
Measuring tape		

Fig. 3

[6]

(c) The distance between Reshme's house to her school is approximately 22 km. Calculate the journey time in minutes for Reshme to travel from the school to her house if the average speed of the school bus is 11 km/hour. Show your workings.

.....minutes [2]

- 5 An irregular shaped object is lowered into a measuring cylinder containing water. Fig 4.1 shows the reading before the solid is lowered into the water. Fig 4.2 shows the reading when the solid is in the water.

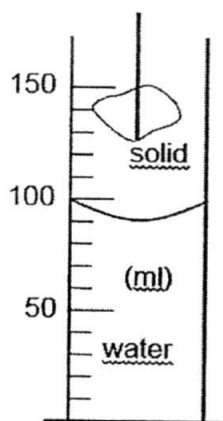


Fig 4.1

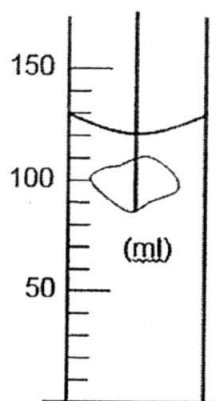


Fig 4.2

- (a) State the volume of the water before and after the solid is lowered into the water.

volume of water before the solid is lowered (Fig 4.1) = ml

volume of water after the solid is lowered (Fig 4.2) = ml

[2]

- (b) The mass of the solid is 50 g. Calculate the density of the solid. Leave your answer in 3 significant figures. Show your workings clearly.

.....g/cm³ [3]

- 6 Fig 5. shows parts of a Bunsen burner.

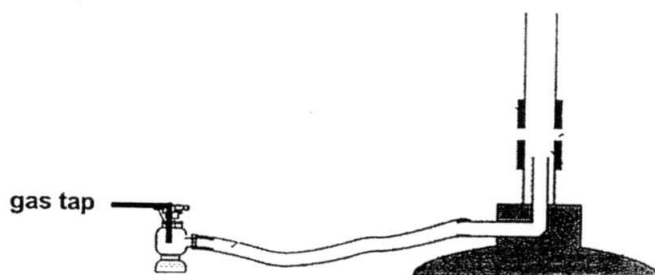


Fig. 5

- (a) Use the words below to label the parts. Draw a straight line when labeling on Fig 5. An example has been done for you.

gas tap
collar

air-hole
barrel

base

[4]

- (b) Read the following situation carefully.

After the Science practical lesson in the Science laboratory, the students were dismissed for their recess. Some of the students went directly to the canteen, bought their food and immediately consumed them.

- (i) Identify the unsafe behaviour exhibited by the students.

.....
.....[1]

- (ii) What precaution should the students have taken?

.....
.....[1]

7 Fig. 6 shows a plant cell model.

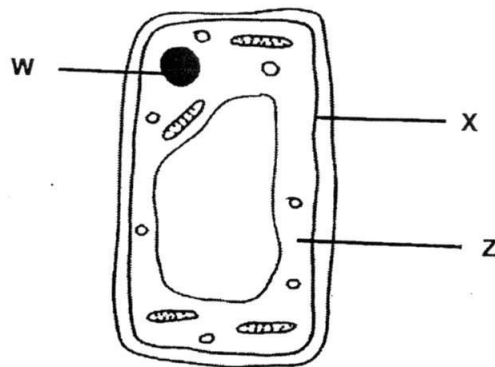


Fig. 6

(a) Label the cell parts.

X :

W :

Z :

[3]

(b) How is the plant cell different from an animal cell?

.....

.....[2]

End of Section B

Section C [30 marks]

Answer all **three** questions in this section.

- 8 After a learning journey to Lee Kong Chian Natural History Museum, a student constructed a dichotomous key on his learning as shown in Fig. 7

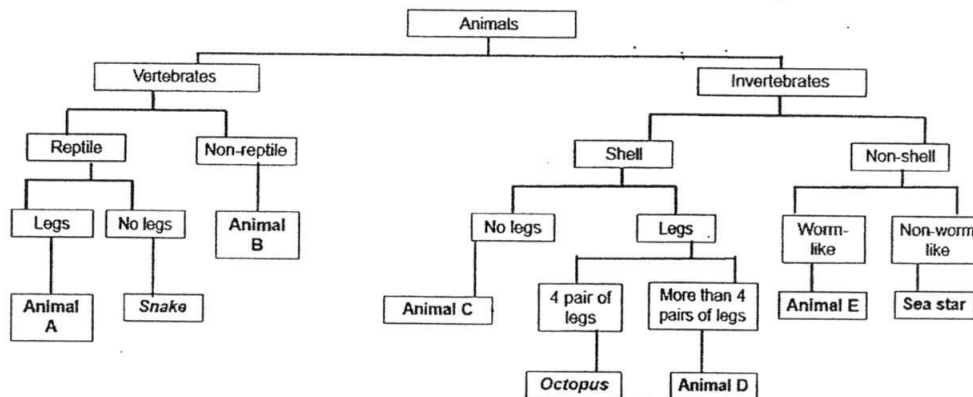


Fig. 7

- (a) Suggest an example for animal **A** to **E** by using the dichotomous key. Two examples of animals are given in the dichotomous key.

animal **A**:

animal **B**:

animal **C**:

animal **D**:

animal **E**: [5]

- (b) Describe the characteristics of the *snake*.

.....

 [2]

- (c) The *octopus* is closely related to the *nautilus*, as shown in Fig. 8.

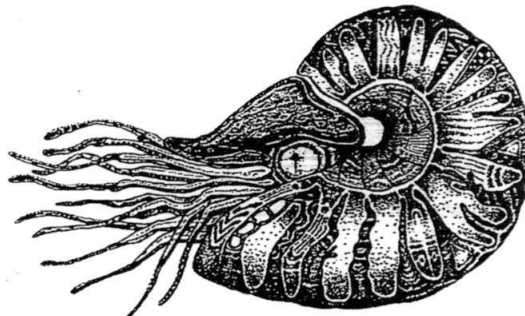


Fig. 8

- (i) With reference to the dichotomous key (Fig.7) **only**, identify the special feature that the octopus has, but not the nautilus.

.....
.....[1]

- (ii) Suggest how the feature identified in **c(i)** helps the octopus survive in the ocean.

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

- 9 John added two spoonfuls of salt to 50 cm³ of water in beaker **A**, and two spoonfuls of chalk powder to 50 cm³ of water in beaker **B**. After stirring, he left the mixtures in beakers **A** and **B** to stand for 10 minutes each.

- (a) Draw his experimental set up below.

[3]

- (b) Identify the different variables for this experiment by using one of the words provided below for each blank.

salt , chalk, amount of water, salt mixture, chalk mixture, spoonful, spoon, stirring, beaker

independent variable :

dependent variable :

constant : [3]

- (c) Identify the solute and solvent in the chalk mixture.

solute :

solvent: [2]

- (d) Describe what John will observe in beakers **A** and **B** after 10 minutes.

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

- 10 The melting and boiling points of three substances are given in Fig.9.

substance	melting point/°C
N	-70
O	-20
P	100

Fig. 9

- (a) At room temperature (28°C), which substance(s) will be in the liquid state?

..... [2]

- (b) Explain your answer in part (a).

.....
..... [1]

- (c) Huge pieces of glacial ice may break off from a glacier and fall into the ocean to form ice bergs, as shown in Fig.10 below.

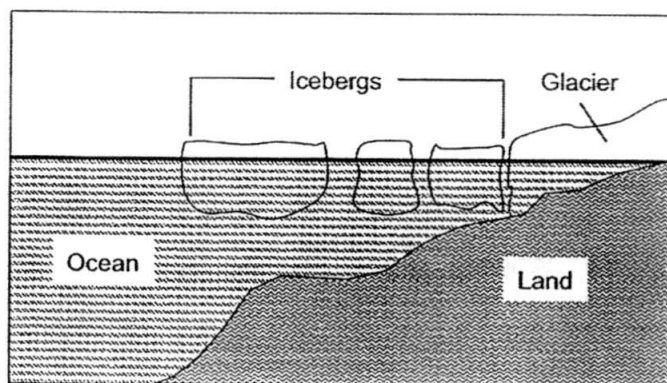


Fig. 10

- (i) What evidence in Fig 10 indicates that icebergs have a lower density than water?

.....
.....[1]

- (ii) A sample of ice berg and ocean water has a mass of 500 kg. Explain why the ice berg has a larger volume compared to ocean water of the same mass.

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

- (iii) Predict **one** environmental change that would **most** likely occur if all the glaciers on Earth melted.

.....
.....[1]

- (d) In an experiment, three bags made of different materials, cotton, paper and plastic, were tested. Weights were added to them separately until the bags tore. The results are tabulated below in Fig 11.

weight added for bag to tear (kg)	bag made of		
	cotton	paper	plastic
	1.2	0.02	0.06

Fig. 11

- (i) Which physical property was being tested in the experiment?
.....[1]
- (ii) State **two** conclusions you can draw from the result of the experiment.
.....
.....[2]

End of paper

The Periodic Table of the Elements

Group																		
I	II											III	IV	V	VI	VII	0	
1 H hydrogen 1																		
7 Li lithium 3	9 Be beryllium 4											11 B boron 5	12 C carbon 6	14 N nitrogen 7	16 O oxygen 8	19 F fluorine 9	20 Ne neon 10	
23 Na sodium 11	24 Mg magnesium 12											27 Al aluminium 13	28 Si silicon 14	31 P phosphorus 15	32 S sulfur 16	35.5 Cl chlorine 17	40 Ar argon 18	
39 K potassium 19	40 Ca calcium 20	45 Sc scandium 21	48 Ti titanium 22	51 V vanadium 23	52 Cr chromium 24	55 Mn manganese 25	56 Fe iron 26	59 Co cobalt 27	59 Ni nickel 28	64 Cu copper 29	65 Zn zinc 30	70 Ga gallium 31	73 Ge germanium 32	75 As arsenic 33	79 Se selenium 34	80 Br bromine 35	84 Kr krypton 36	
85 Rb rubidium 37	88 Sr strontium 38	89 Y yttrium 39	91 Zr zirconium 40	93 Nb niobium 41	96 Mo molybdenum 42	101 Ru ruthenium 44	101 Rh rhodium 45	103 Pd palladium 46	106 Ag silver 47	108 Cd cadmium 48	112 In indium 49	115 Sn tin 50	119 Sb antimony 51	122 Te tellurium 52	128 I iodine 53	131 Xe xenon 54		
133 Cs caesium 55	137 Ba barium 56	139 La lanthanum 57	178 Hf hafnium 72	181 Ta tantalum 73	184 W tungsten 74	186 Re rhenium 75	190 Os osmium 76	192 Ir iridium 77	195 Pt platinum 78	197 Au gold 79	201 Hg mercury 80	204 Tl thallium 81	207 Pb lead 82	209 Bi bismuth 83	210 Po polonium 84	210 At astatine 85	210 Rn radon 86	
87 Fr francium	88 Ra radium	89 Ac actinium																

58-71 Lanthanoid series
†90-103 Actinoid series

140 Ce cerium 58	141 Pr praseodymium 59	144 Nd neodymium 60	150 Sm samarium 62	152 Eu europium 63	157 Gd gadolinium 64	159 Tb terbium 65	162 Dy dysprosium 66	165 Ho holmium 67	167 Er erbium 68	173 Yb ytterbium 70	175 Lu lutetium 71						
232 Th thorium 90	238 Pa protactinium 91	238 U uranium 92	238 Pu plutonium 94	238 Np neptunium 93	238 Am americium 95	238 Cm curium 96	238 Bk berkelium 97	238 Cf californium 98	238 Es einsteinium 99	238 Fm fermium 100	238 Md mendelevium 101	238 No nobelium 102	238 Lr lawrencium 103				

Key

a

X

b

a = relative atomic mass
X = atomic symbol
b = proton (atomic) number

Sec 1 NA EOY 2016 Mark Scheme

Section A

Q1	Q2	Q3	Q4
C	B	B	A
Q5	Q6	Q7	Q8
A	C	A	B
Q9	Q10	Q11	Q12
B	C	D	D
Q13	Q14	Q15	Q16
D	A	A	C
Q17	Q18	Q19	Q20
A	D	B	D
Q21	Q22	Q23	Q24
C	A	A	A
Q25	Q26	Q27	Q28
B	A	A	B
Q29	Q30	-	-
A	A	-	-

1a) Mg

[1]

1b) Group II (Reject '2')

[1]

1c)

- It is a **metal**.
- It is **shiny**.
- It is a **solid** at room temperature/ **high melting point**
- It is a **good conductor** of heat/ good conductor of electricity.

[2]

(Do not accept strong, magnetic, high/ low density)

(2 marks for any of the above two points)

1(d)

- **Left hand side** of the periodic table are all **metals**

[1]

OR

- It is a **metal**. (Reject repetitive answer; for example 1c) metal.
1d)metal

2a)

- Have true roots / have roots/ reproduce by seed/ have seeds

[1]

2b)

i)

- Have **no** true roots (Reject non-flowering plants)

[1]

ii)

- Have true roots
- Reproduce by spores

[2]

- 3a)
 - Plastic
 - Metal
 - Cotton
 - Glass [2]

1 Mark for 2 correct answer.

- b)
 - Translucent/ transparent
 - High melting point
 - Poor conductor of heat
 - Resist to scratches
 - Low density/ it is light
 - The plastic does not break easily.
 - The plastic is strong.
 - Plastic is a poor conductor of electricity. [2]

• **(Reject durable)**
(Accept any 2 points)

- c)
 - We can make something that does not **spoil** [1]

OR

- The material suit the **uses** of the products.

(Candidates who attempt to use examples to support their claim can get 1m)

- 4ai)
 - $12.5 \text{ cm} + 0.10\text{cm} = 12.60\text{cm}$ OR 12.59 cm [1]

- 4aii)
 - $11.3 \text{ cm} + 0.07\text{cm} = 11.37\text{cm}$ [1]

- b) [6]

Apparatus	Quantity measured	SI unit
Electronic balance	Mass	kg
Digital stopwatch	Time	s
Measuring tape	Length	m

- c) • 22 / 11 = 2 hours [2]
 • 2 hours = 120 min
- 5a) • Before : 90 ml [2]
 • After : 120ml
- b) • 120ml – 90 ml = 30 ml [3]
 •
 50/ 30 = 1.67 g/ml
- If students shown the 30ml without working on the difference, award 1m
 • Correct working on density= mass/ volume but wrong answer : 1m
 • Do not penalise answers with wrong values from 5a. (e.c.f)
 • Accept answer that is not 3 significant.
- 6a) • Correct labels [4]
- 6bi) • Students **did not wash their hands** after the lab practical. [1]
 6bii) • Students **must wash their hand** after the lab [1]
- 7b) • It has cell wall. [2]
 • It has a large vacuole at the centre.
 • The plant cell has chloroplasts / chlorophyll.
 No mark for wrong spelling
 2 marks for 2 different features
- 7a) • X: cell membrane [3]
 • W: nucleus
 • Z: cytoplasm
 No mark for wrong spelling
- 8a) • Animal A: Sea turtle (Reptiles with legs) [5]
 • Animal B: Birds (mammals or amphibians)
 • Animal C: Snails (Invertebrate + shell)
 • Animal D: Prawns (crab, horseshoe crab)
 • Animal E: caterpillar/ centipedes (**reject** worm)
- 8b) • Snake has a **backbone** / a vertebrate and [2]
 • it **has no legs**.
 (Reject Reptiles)

- 8ci) • Octopus has **eights tentacles/legs** / legs while **nautilus has more tentacles/legs**. [1]

OR

- Octopus **does not have outer shell** / shell is inside octopus

- 8cii) (Students must explain how the characteristic helps in the movement of the animal [1], and how that help it survive in the habitat [1]. [2]

- Eight tentacles help the Octopus walk on the ocean floor
- Hence, easier to hide from **predators**/ ambush on its **preys**

OR

- Without a heavy shell on its body, **octopus** can swim very fast.
- This allow it to escape from its predator easily/ ~~easily camouflage~~/ hide in small crevices.

- 9a) 1m for correct cross-section diagram of beaker [3]
1m for same amount of water in the two beakers
1m for differentiation between salt water and chalk water (shaded or non-shaded) OR clear label on "salt water" or 'chalk water'

Reject spoon drawings.

(1 mark is deducted from pen drawing)

- (b) • Independent variable : salt / chalk [1m for any point] [3]
• Dependent variable: chalk mixture / salt mixture [1m for any point]
• Constant: spoonful of salt and chalk / amount of water in each beaker/ stirring [1m for any point]

- (c) • Solute: chalk [2]
• Solvent: Water

- (d) • Clear water in beaker A [2]
• Chalk settles at the bottom of beaker B/ Water in beaker B s cloudy.

- 10a) • Substance N and O [2]

- 10b) • Substance N **melt** / **change from solid to liquid** at -70°C / -20°C [1]

- (ci) • Ice bergs **float** on the water. [1]

- (cii) • The density of a substance is the ratio [1] of its mass to volume. [1] [2]

OR

- The ice has **low** [1] + **density** [1].

- (ciii) • Sea level rise/ flooding [1]
- (Reject global warming)
- di) • Strength [1]
- dii) • Cotton is the strongest material. [2]
- Paper is the least strong material.