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Name:

Index Number:

Class:

YIO CHU KANG SECONDARY SCHOOL
END OF YEAR EXAMINATION 2016
SECONDARY ONE NORMAL (ACADEMIC)



SCIENCE Syll A

Friday

7 October 2016

1 hour 30 minutes

Additional Material: Optical Answer Sheet (OAS)

READ THESE INSTRUCTIONS FIRST

Write your name, index number and class on the cover page.

Write in dark blue or black ink.

You may use a soft pencil for any diagrams or graphs.

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

SECTION A: Multiple Choice Questions

This section consists of **thirty** multiple choice questions. 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 OAS.

SECTION B: Structured Questions

This section consists of structured questions. Answer **all** questions.

Write your answers in the spaces provided.

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

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

A copy of the Periodic Table is printed on page 17.

For Examiner's Use

Section A	/ 30
Section B	/ 50
Total	/ 80

Parent's / Guardian's signature

Name of Setter: Ms Shereen Seah

This document consists of **17** printed pages and **1** blank page.

SECTION A [30]: Multiple Choice Questions

Answer **all** questions in soft pencil on the separate OAS.

- 1 Most of the chemical reactions in a cell take place in the _____.
- A cell membrane
 - B chromosomes
 - C cytoplasm
 - D nucleus
- 2 Plants contain _____ to trap sunlight to carry out photosynthesis.
- A chlorophyll
 - B guard cells
 - C haemoglobin
 - D sap
- 3 Which of the following has one large vacuole filled with cell sap?
- A cheek
 - B heart
 - C onion
 - D stomach
- 4 Which of the following is **not** classified as an organ?
- A brain
 - B hair
 - C leaf
 - D liver
- 5 The speed of light in vacuum is _____ m/s.
- A 300
 - B 30,000
 - C 300,000
 - D 300,000,000

- 6 Which of the following is an inherited trait of humans?
- A ability to draw
 - B ability to ride a bicycle
 - C ability to roll tongue
 - D ability to run very fast
- 7 Which type of mirror is placed behind a car's headlight?
- A concave mirror
 - B convex mirror
 - C plane mirror
 - D square mirror
- 8 Which of the following has the smallest mass?
- A a neutron
 - B a proton
 - C an atom
 - D an electron
- 9 Which of the following mixtures can be separated by adding water, stirring and filtering?
- A copper sulfate and coffee powder
 - B iron and copper fillings
 - C orange syrup and salt
 - D zinc powder and milo powder
- 10 What causes a swimming pool to appear shallower than its real depth?
- A both reflection and refraction of light
 - B dispersion of white light
 - C reflection of light
 - D refraction of light
- 11 Which of the following is **not** a characteristic of an image formed in a convex mirror?
- A the image is brighter than the object
 - B the image is distorted and smaller than object
 - C the image is laterally inverted
 - D the image is upright

12 The hardness of a material is _____.

- A its ability to bend without breaking
- B its ability to support a heavy load without breaking or tearing
- C its ability to withstand scratches
- D the quantity of matter packed into a unit volume of the material.

13 What is the solvent in a cup of hot coffee with condensed milk and sugar?

- A coffee powder
- B condensed milk
- C hot water
- D sugar

14 Which of the following is **not** a characteristic of the luminous Bunsen burner flame?

- A It is less hot than the non-luminous flame.
- B It is sooty.
- C It is steady.
- D It is yellow in colour.

15 Which of the following shows the correct relative charges of the sub-atomic particles of an atom?

	proton	neutron	electron
A	- 1	0	+ 1
B	0	+ 1	- 1
C	+ 1	0	- 1
D	+ 1	- 1	0

16 During the heating of liquid in a test tube, we should _____.

- I. ensure that the liquid is not filled up to the brim of the test tube
- II. keep the test tube in upright position
- III. always use a stopper to cover the mouth of the test tube
- IV. always use a test tube holder to hold the test tube

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

- 17 Which of the following apparatus is most suitable for evaporating a solution to dryness?



- 18 Which of the following substances is ductile?

- A fluorine
- B iron
- C nitrogen
- D sulfur

- 19 Which of the following will produce diffused reflection?

- A concrete wall
- B glass window
- C polished table top
- D still water

- 20 A molecule of hydrogen peroxide has two hydrogen atoms and two oxygen atoms.

What is its chemical formula?

- A $2\text{H}_2\text{O}$
- B $2\text{H}_2\text{O}$
- C H_2O_2
- D H_2O_2

- 21 Which of the following shows a compound with **three** elements?

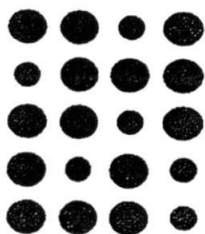
- A CuSO_4
- B H_2O
- C MgO
- D O_3

- 22 The following hazard symbol is labelled on a bin.



What could be found in the bin?

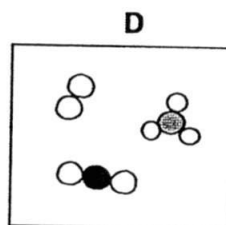
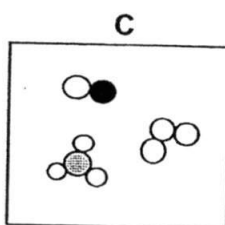
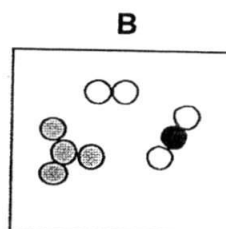
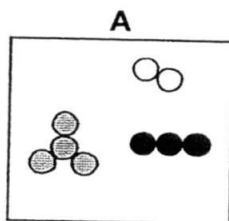
- A blood
 - B chloroform
 - C mercury
 - D uranium
- 23 Which of the following is a compound?
- A air
 - B iron
 - C salt solution
 - D table salt
- 24 How many types of atoms make up the substance below?



- A Fourteen
 - B Six
 - C Twenty
 - D Two
- 25 A rainbow is formed as a result of the _____ of sunlight by the raindrops.
- A absorption
 - B combination
 - C dispersion
 - D reflection

- 26 An image which cannot be caught on a screen is said to be _____.
- A false
 - B imaginary
 - C real
 - D virtual
- 27 Which of the following statements is true about a compound?
- A A compound can be separated by physical means.
 - B A compound is made up of two or more elements chemically combined together.
 - C The elements that make up a compound are not combined in a fixed proportion by mass.
 - D The properties of a compound are the same as the properties of the elements it is made up of.
- 28 Which of the following groups of elements consists of only metals?
- A copper, carbon
 - B magnesium, silicon
 - C sodium, zinc
 - D sulfur, iodine
- 29 The following statement is written by a student who is carrying out an investigation using the scientific method.
- "If a plant receives enough sunlight, then it will grow to be taller than a plant that does not receive enough sunlight."*
- At which stage of the scientific method is the student at?
- A asking a question
 - B constructing a hypothesis
 - C drawing a conclusion
 - D making an observation

- 30 Which of the following best represents a mixture of oxygen (O_2), ammonia (NH_3) and carbon dioxide (CO_2) gases?



SECTION B [50]: Structured QuestionsAnswer **all** questions in the spaces provided.**31 (a)** Convert the following quantities to the specified units.

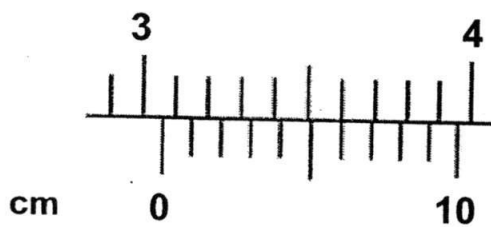
(i) $500 \text{ m} = \dots\dots\dots \text{ km}$

(ii) $2.4 \text{ litres} = \dots\dots\dots \text{ cm}^3$

[2]

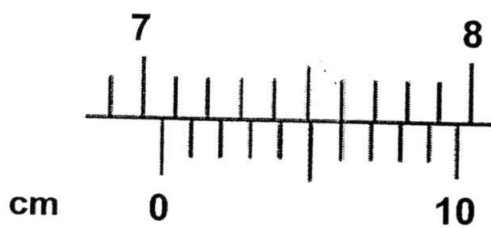
(b) Determine the readings of the measurements made by using Vernier Calipers.

(i)



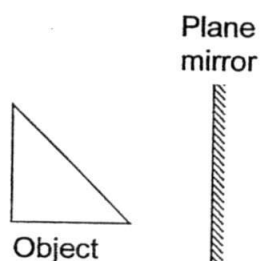
Reading= _____ cm [1]

(ii)



Reading= _____ cm [1]

- 32 The diagram below shows an object placed in front of a plane mirror.



- (a) Draw the mirror image of the object as seen in the plane mirror above. [3]

- (b) State **three** characteristics of an image formed by a plane mirror.

.....

.....

.....

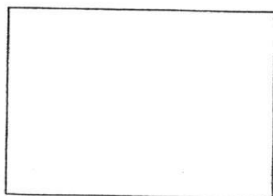
[3]

- (c) If the object is placed 5 cm in front of the mirror, calculate the distance between the object and its image.

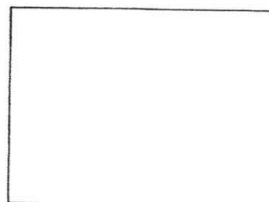
[1]

33 (a) In each of the boxes below, draw a diagram to represent:

(i) A parallel beam of light.

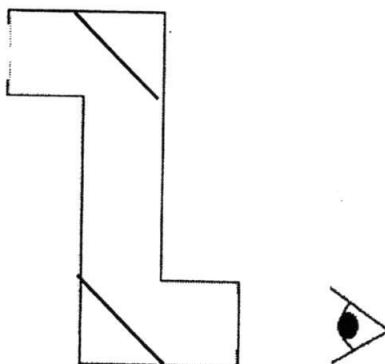


(ii) A divergent beam of light



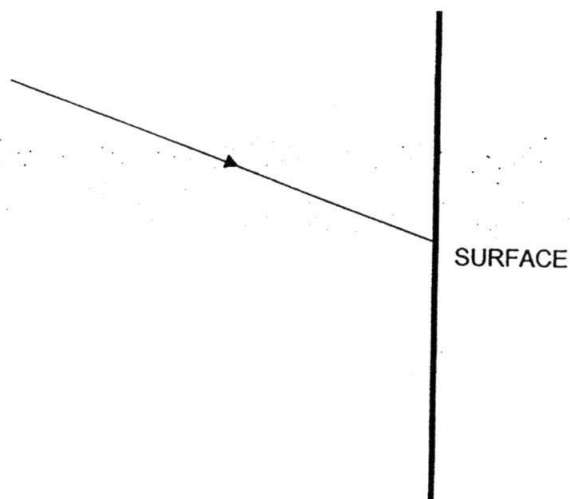
[2]

(b) Complete the following diagram by drawing the path of the light ray in the periscope.



[1]

(c) In the following ray diagram,
 (i) draw the normal;
 (ii) measure the angle of incidence (i);
 (iii) draw the reflected ray



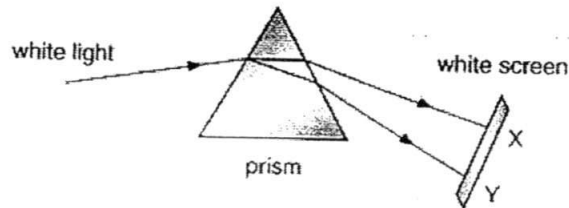
[3]

(iv) State the angle of reflection.

.....

[1]

- (d) Name all the colours in the light spectrum, starting from X to Y.



[1]

- 34 (a) Fig. 3.1 shows the arrangement of particles in solid ice. In Fig. 3.2, draw the arrangement of particles in melted ice.

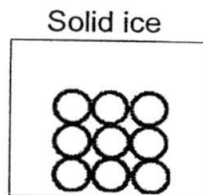


Fig. 3.1

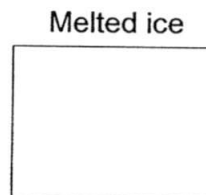


Fig. 3.2

[2]

- (b) Solid ice has a fixed shape. Explain why solid ice loses its shape after it has melted.

[1]

- (c) How does the movement of the particles in solid ice differ from the movement of the particles in melted ice?

[2]

- 35 (a) A substance has the chemical formula $\text{Ca}(\text{NO}_3)_2$. How many atoms are there in this substance?

..... [1]

- (b) Using the Periodic Table, state the elements present in $\text{Ca}(\text{NO}_3)_2$.

..... [1]

- (c) The structure of an atom of the above element is shown in the diagram below.



What is the nucleon number of this atom?

..... [1]

- 36 (a) Which type of cloning would scientists use to clone human?

..... [1]

- (b) Suggest **one** advantage and **one** disadvantage of human cloning.

Advantage:

.....

Disadvantage:

..... [2]

- (c) Plants can also be cloned. Suggest **one** advantage and **one** disadvantage of cloning plants.

Advantage:

.....

Disadvantage:

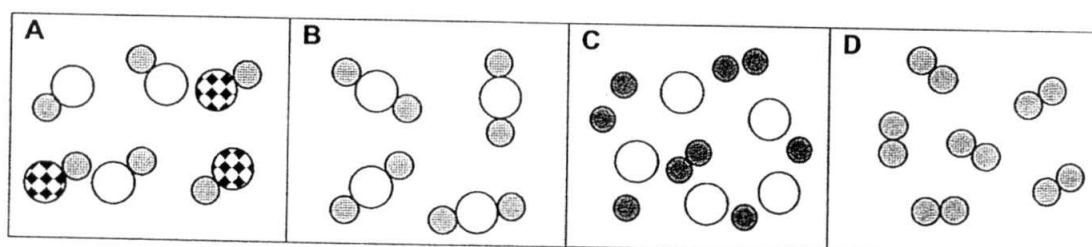
..... [2]

- 37 Draw a diagram to illustrate a typical animal cell and label the following parts.

cell membrane	chromosomes	cytoplasm	nucleus	vacuoles
---------------	-------------	-----------	---------	----------

[5]

- 38 The drawings below represent different substances.

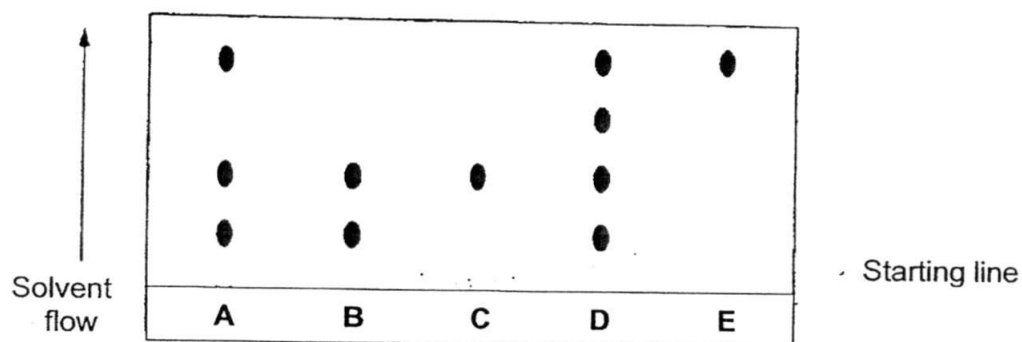


Complete the following table below to show which one of the drawings, **A** to **D**, best represents each of the following substances. Each letter can only be used **once**.

	a compound	an element	a mixture of compound	a mixture of elements
Substance A to D				

[3]

- 39 Chromatography is carried out to find out the number of coloured component(s) used in five different samples of inks A to E. The chromatogram obtained is shown below.



- (a) Which ink(s) is/are pure?

..... [1]

- (b) Which two inks when mixed will form ink A?

..... [1]

- (c) A pencil is used to draw the starting line. Explain why a pencil is used instead of a pen.

..... [1]

- 40 Kelvin has 10 marbles. The mass of each marble is 8 g. He placed the 10 marbles in a measuring cylinder containing some water and the water level rises from 40 cm³ to 80 cm³.

- (a) Calculate the average volume of 1 marble.

..... [1]

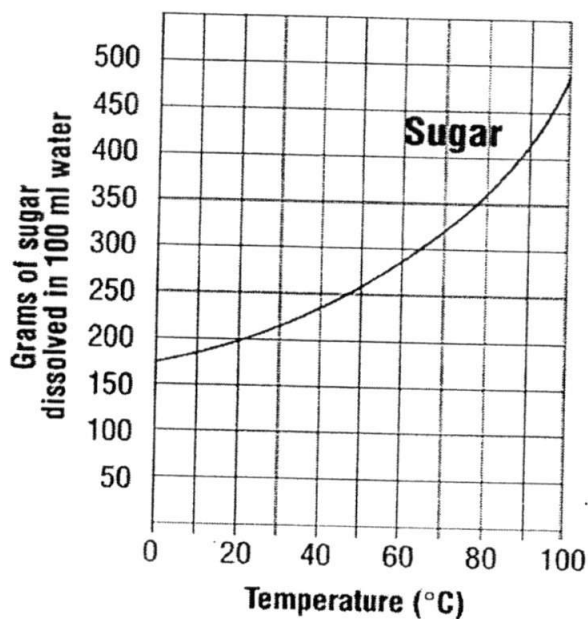
- (b) Calculate the density of 1 marble. Show your working clearly with units.

.....
 [1]

- (c) Liquid Y has a density of 3 g/cm³. State whether a marble would sink or float in liquid Y.

.....
 [1]

- 41 Timothy is trying to investigate the solubility of rock sugar in water at different temperatures. A plot of the experiment results is shown in the graph below.



- (a) Identify **one** variable that has to be kept constant when conducting the experiment.

..... [1]

- (b) Suggest **two** things Timothy can do if he wants to increase the rate of sugar dissolving in water.

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

- (c) From the graph, what can Timothy conclude regarding the solubility of sugar in water at different temperatures?

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

- End of Paper -

The Periodic Table of the Elements

Periodic Table of the Elements

Group

I	II											III	IV	V	VI	VII	0
1 H hydrogen 7 Li lithium 9 Be beryllium 11 Na sodium 12 Mg magnesium 13 Al aluminium 14 Si silicon 15 P phosphorus 16 S sulfur 17 Cl chlorine 18 Ar argon 19 K potassium 20 Ca calcium 21 Sc scandium 22 Ti titanium 23 V vanadium 24 Cr chromium 25 Mn manganese 26 Fe iron 27 Co cobalt 28 Ni nickel 29 Cu copper 30 Zn zinc 31 Ga gallium 32 Ge germanium 33 As arsenic 34 Se selenium 35 Br bromine 36 Kr krypton 37 Rb rubidium 38 Sr strontium 39 Y yttrium 40 Zr zirconium 41 Nb niobium 42 Mo molybdenum 43 Tc technetium 44 Ru ruthenium 45 Rh rhodium 46 Pd palladium 47 Ag silver 48 Cd cadmium 49 In indium 50 Sn tin 51 Sb antimony 52 Te tellurium 53 I iodine 54 Xe xenon 55 Cs caesium 56 Ba barium 57 La lanthanum 58 Ce cerium 59 Pr praseodymium 60 Nd neodymium 61 Pm promethium 62 Sm samarium 63 Eu europium 64 Gd gadolinium 65 Tb terbium 66 Dy dysprosium 67 Ho holmium 68 Er erbium 69 Tm thulium 70 Yb ytterbium 71 Lu lutetium 72 Hf hafnium 73 Ta tantalum 74 W tungsten 75 Re rhenium 76 Os osmium 77 Ir iridium 78 Pt platinum 79 Au gold 80 Hg mercury 81 Tl thallium 82 Pb lead 83 Bi bismuth 84 Po polonium 85 At astatine 86 Rn radon 87 Fr francium 88 Ra radium 89 Ac actinium 90 Th thorium 91 Pa protactinium 92 U uranium 93 Np neptunium 94 Pu plutonium 95 Am americium 96 Cm curium 97 Bk berkelium 98 Cf californium 99 Es einsteinium 100 Fm fermium 101 Md mendelevium 102 No nobelium 103 Lr lawrencium																	2
3	4											5	6	7	8	9	10
20	19											13	14	15	16	17	18
37	36											31	32	33	34	35	36
55	54											49	50	51	52	53	54
87	86											81	82	83	84	85	86
133 Cs caesium 137 Ba barium 139 La lanthanum 140 Ce cerium 141 Pr praseodymium 142 Nd neodymium 143 Pm promethium 144 Sm samarium 145 Eu europium 146 Gd gadolinium 147 Tb terbium 148 Dy dysprosium 149 Ho holmium 150 Er erbium 151 Tm thulium 152 Yb ytterbium 153 Lu lutetium 154 Hf hafnium 155 Ta tantalum 156 W tungsten 157 Re rhenium 158 Os osmium 159 Ir iridium 160 Pt platinum 161 Au gold 162 Hg mercury 163 Tl thallium 164 Pb lead 165 Bi bismuth 166 Po polonium 167 At astatine 168 Rn radon 169 Fr francium 170 Ra radium 171 Ac actinium 172 Th thorium 173 Pa protactinium 174 U uranium 175 Np neptunium 176 Pu plutonium 177 Am americium 178 Cm curium 179 Bk berkelium 180 Cf californium 181 Es einsteinium 182 Fm fermium 183 Md mendelevium 184 No nobelium 185 Lr lawrencium																	2

*58-71 Lanthanoid series
†90-103 Actinoid series

Key

a

X

b

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

*58-71 Lanthanoid series
†90-103 Actinoid series

Key $\begin{matrix} a & \\ & X \\ & b \end{matrix}$ a = relative atomic mass
X = atomic symbol
b = proton (atomic) number

The volume of one mole of any gas is 24 dm³ at room temperature and pressure (r.t.p.).

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Ans

13a	Generation of a genetically identical organism	1
b	Reproductive cloning	1
c	Advantages: <i>[Any 1]</i> • Humans with special characteristics may be created • Couples unable to conceive can have a child • Can have identical twins Disadvantages: <i>[Any 1]</i> • Procedure may not be successful hence wastage of cells • The cloned baby may have some abnormalities • The human being clone may experience trauma during the process of cloning • Cloned baby may not survive long	1

YIO CHU KANG SECONDARY SCHOOL
MARKING SCHEME

Exam: EOY 2016

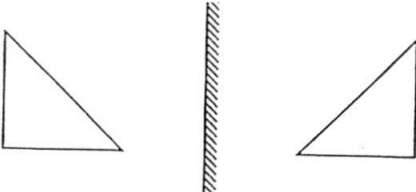
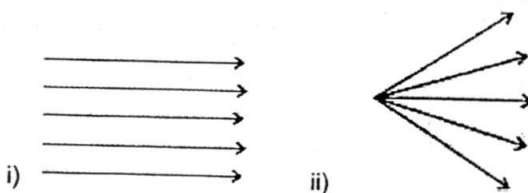
Subject: LSS Science

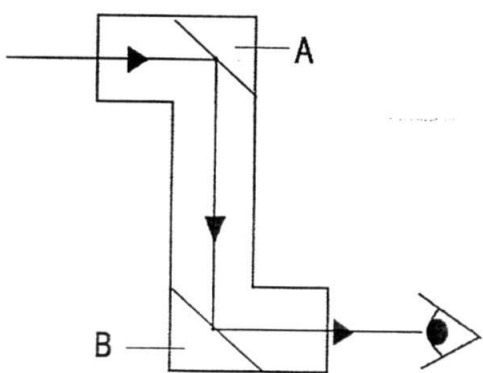
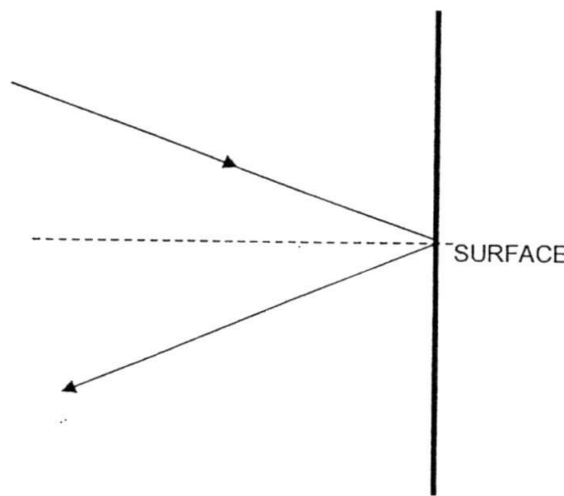
Level: 1NA

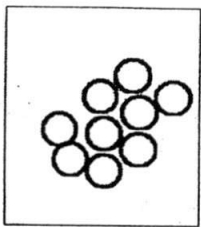
Section A (MCQ)

01.	C	16	B
02.	A	17	C
03.	C	18	B
04.	B	19	A
05.	D	20	D
06.	C	21	A
07.	A	22	A
08.	D	23	D
09.	D	24	D
10.	D	25	C
11.	A	26	D
12.	C	27	B
13.	C	28	C
14.	C	29	B
15.	C	30	D

Section B

31	(a)	(i) 0.5 km (ii) 2400 cm ³	[1]
	(b)	(i) 3.06 (ii) 7.06	[1]
			[1]
32	a		[1] for correct 'flip' of diagram [1] for correct distance from mirror [1] for correct size.
	b	The image is virtual / The image is same size as object. / The image is upright / The image is laterally inverted / The distance the image is from the mirror is the same as that of the object from the mirror.	[3] for any 3 points
	c	5 + 5 = 10 cm	[1]
33	(a)		[1] for direction of arrow and parallel lines [1] for arrow and diverging rays

	(b)		[1] for direction of arrow with straight lines of path
	(c)	(i) to (iii)  (iv) 20°	[1] for normal [1] for angle i (20°) [1] for reflected ray with arrow (correct angle of 20°)
	(d)	Red, orange, yellow, green, blue, indigo, violet	[1] No mark for wrong arrangement of colours

34	(a)		[1] 9 atoms [1] irregular arrangement of atoms
	(b)	When it becomes liquid, the particles of a melted ice are no longer packed in an orderly arrangement / the particles are not in their fixed positions.	[1]
	(c)	Solid particles vibrate about their fixed positions whereas the particles in melted ice slide past one another.	[1] [1]
35	(a)	9 atoms	[1]
	(b)	Calcium, nitrogen, oxygen	[1]
	(c)	40	[1]
36	(a)	Reproductive cloning	[1]
	(b)	Advantages: [Any 1]	[2]
		Humans with special characteristics may be created	

		- Couples unable to conceive can have a child or identical twins Disadvantages: [Any 1] - The cloned baby may have some abnormalities or allergies. - Cloned baby may not survive long/Short lifespan of the cloned baby												
	(c)	Advantages: [Any 1] - Longer shelf life - Better quality of crops - Large quantities may be produced in shorter time Disadvantages: [Any 1] - May cause diseases - May have side effects like allergies on humans	[2]											
37	(a)		[5] for 5 parts No mark awarded for plant cell											
38	<table border="1"> <tr> <td>Substance</td><td>a compound</td><td>an element</td><td>a mixture of compound</td><td>a mixture of elements</td></tr> <tr> <td>A to D</td><td>B</td><td>D</td><td>A</td><td>C</td></tr> </table>			Substance	a compound	an element	a mixture of compound	a mixture of elements	A to D	B	D	A	C	[3]
Substance	a compound	an element	a mixture of compound	a mixture of elements										
A to D	B	D	A	C										
39	(a)	C and E		[1]										
	(b)	B and E		[1]										
	(c)	The pencil lead will not dissolve in solvent. / The pencil lead is not soluble./ the pen ink will smudge with other inks.		[1]										
40	(a)	Volume of 10 marbles = $80 - 40 \text{ cm}^3$ $= 40 \text{ cm}^3$ Volume of 1 marble = $40 / 10 = 4 \text{ cm}^3$		[1]										
	(b)	Density = $8 / 4 = 2 \text{ g/cm}^3$		[1]										
	(c)	The marble will float.		[1]										
41	(a)	The amount of water/ the amount (grams) of rock sugar/ same size of beaker/ size/type of sugar		Any one-[1]										
	(b)	He can crush the rock sugar to smaller pieces of sugar. / He can use a stirrer and stir the mixture faster to dissolve the sugar. / He can use a hotter solvent. / He can heat up the solvent.		[1] for one thing, [1] for second thing										
	(c)	The higher the temperature, the greater amount of sugar dissolved / The higher the temperature, the more soluble the sugar/ the solubility increases with temperature. Do not accept: "the higher the temperature, the faster the sugar dissolves"		[1]										

