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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.

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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

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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 that the object
B the image is distorted and smaller than object
C the image is laterally inverted
D the image is upright

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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

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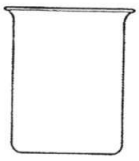
17 Which of the following apparatus is most suitable for evaporating a solution to dryness?

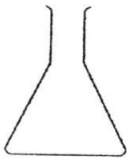
A

B



C

D



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 2H2O
B $2H_2O$
C H2O2
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

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22 The following hazard symbol is labelled on a bin.

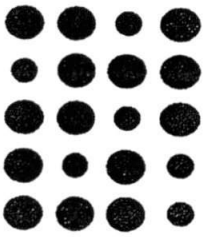
What could be found in the bin?

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

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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

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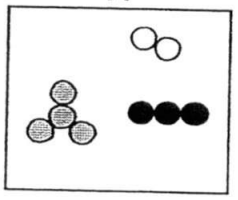
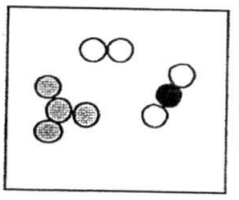
30 Which of the following best represents a mixture of oxygen (O_2), ammonia (NH_3) and carbon dioxide (CO_2) gases?

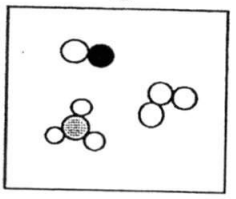
A



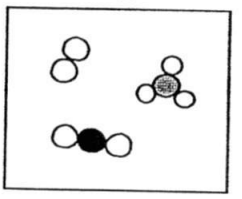
B



C



D



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SECTION B [50]: Structured Questions
Answer **all** questions in the spaces provided.

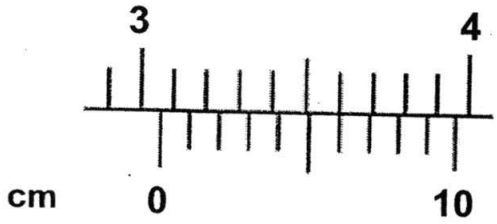
31 **(a)** Convert the following quantities to the specified units.

(i) 500 m = ... km

(ii) 2.4 litres = ... cm^3 [2]

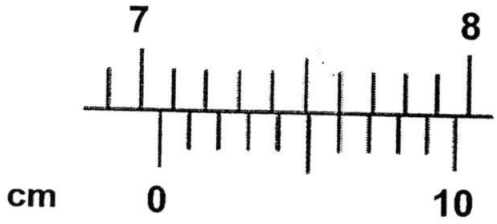
(b) Determine the readings of the measurements made by using Vernier Calipers.

(i)



Reading= _____ cm [1]

(ii)



Reading= _____ cm [1]

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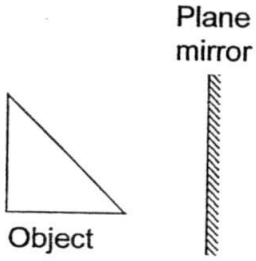
32 The diagram below shows an object placed in front of a plane mirror.



(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]

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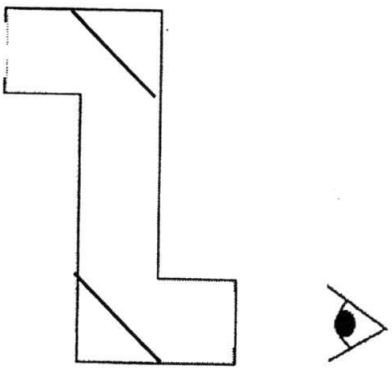
33 **(a)** In each of the boxes below, draw a diagram to represent:

(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.



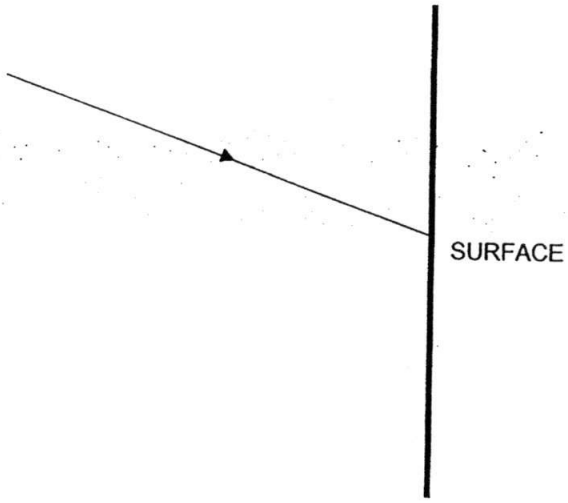
[1]

(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]

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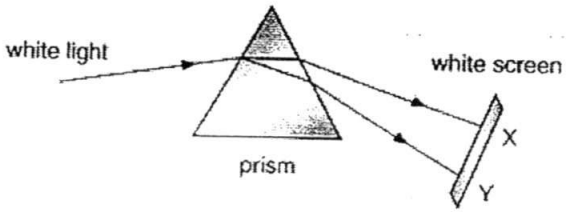
(d) Name all the colours in the light spectrum, starting from X to Y.



..... [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.

Solid ice

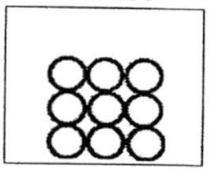


Fig. 3.1

Melted ice

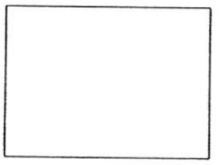


Fig. 3.2

[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]

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35 **(a)** A substance has the chemical formula $Ca(NO_3)_2$. How many atoms are there in this substance?

..... [1]

(b) Using the Periodic Table, state the elements present in $Ca(NO_3)_2$.

..... [1]

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

$$^{40}_{20}Ca$$

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]

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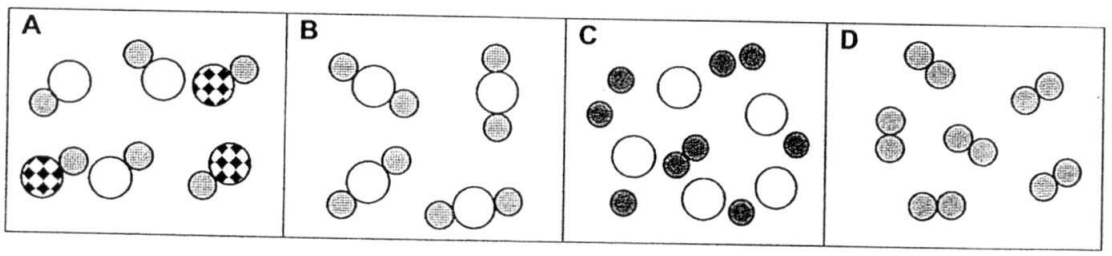
37 Draw a diagram to illustrate a typical animal cell and label the following parts.

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]

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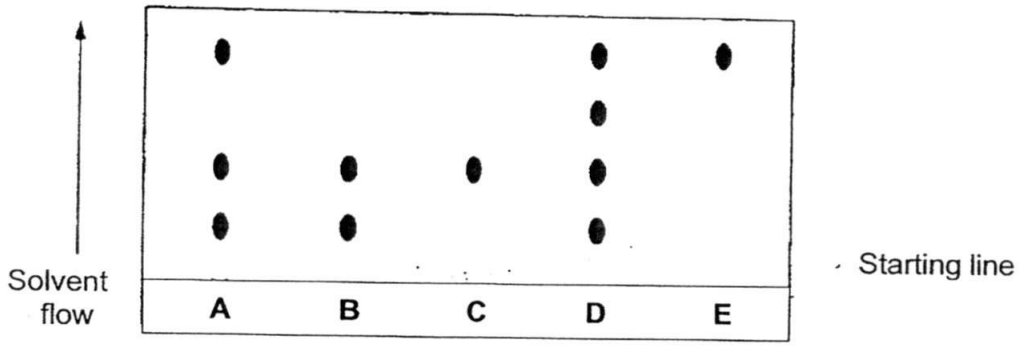
39 Chromatography is carried out to find out the number of coloured component(s) used in five different samples of inks **A** to **E**. The chromatogram obtained is shown below.



(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 cm^3 to 80 cm^3.

(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/cm^3. State whether a marble would sink or float in liquid **Y**.

.....

..... [1]

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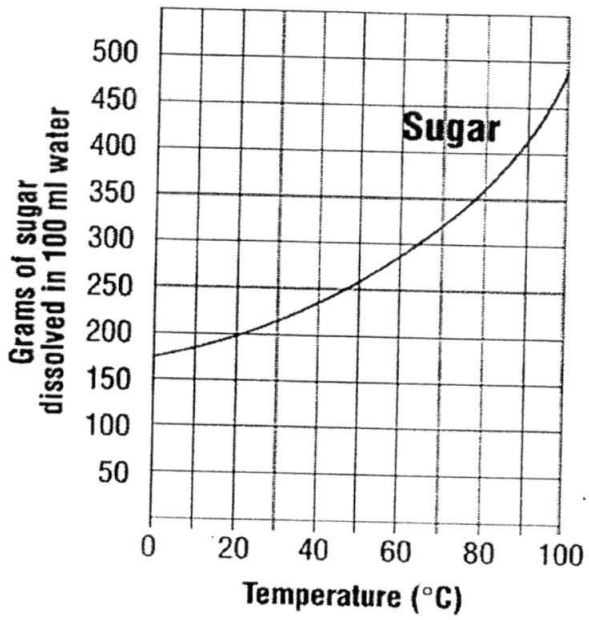
41 Timothy is trying to investigate the solubility of rock sugar in water at different temperatures. A plot of the experiment results is shown in the graph below.



(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 -

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The Periodic Table of the Elements

Group I	Group II											Group III	Group IV	Group V	Group VI	Group VII	Group 0
							1 H hydrogen 1										4 He helium 2
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	– Tc technetium 43	101 Ru ruthenium 44	103 Rh rhodium 45	106 Pd palladium 46	108 Ag silver 47	112 Cd cadmium 48	115 In indium 49	119 Sn tin 50	122 Sb antimony 51	128 Te tellurium 52	127 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	– Po polonium 84	– At astatine 85	– Rn radon 86
– Fr francium 87	– Ra radium 88	– Ac actinium 89 †															

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

140 Ce cerium 58	141 Pr praseodymium 59	144 Nd neodymium 60	– Pm promethium 61	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	169 Tm thulium 69	173 Yb ytterbium 70	175 Lu lutetium 71
232 Th thorium 90	– Pa protactinium 91	238 U uranium 92	– Np neptunium 93	– Pu plutonium 94	– Am americium 95	– Cm curium 96	– Bk berkelium 97	– Cf californium 98	– Es einsteinium 99	– Fm fermium 100	– Md mendelevium 101	– No nobelium 102	– Lr lawrencium 103

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

The volume of one mole of any gas is 24 dm^3 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: *[Any 1]* • Humans with special characteristics may be created • Couples unable to conceive can have a child • Can have identical twins Disadvantages: *[Any 1]* • 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 1

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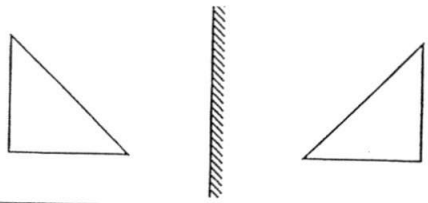
YIO CHU KANG SECONDARY SCHOOL
MARKING SCHEME

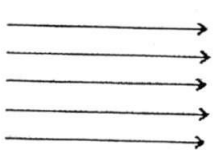
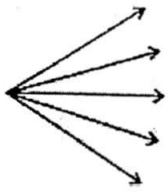
Exam: EOY 2016 Subject: LSS Science Level: 1NA

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	[1]
		(ii) 2400 cm^3	[1]
	(b)	(i) 3.06	[1]
		(ii) 7.06	[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)	i)  ii) 	[1] for direction of arrow and parallel lines [1] for arrow and diverging rays

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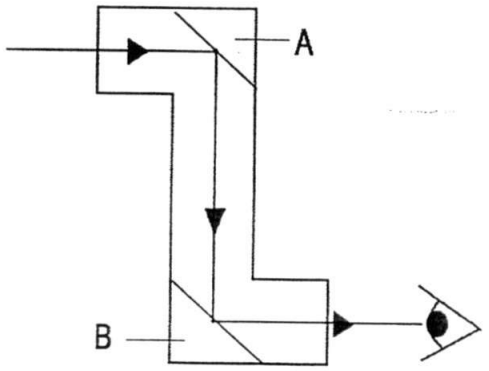
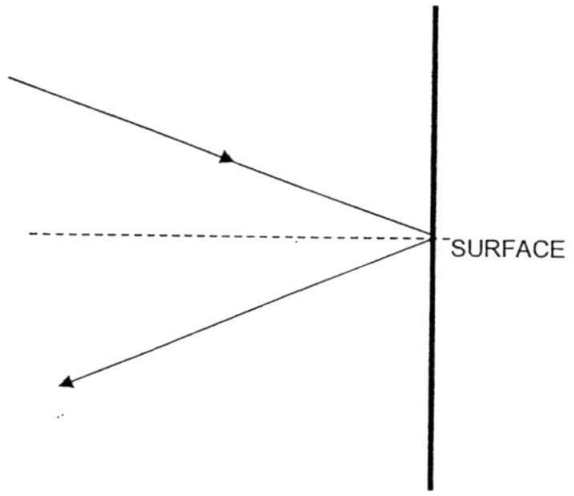
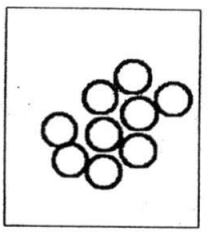
	(b)		[1] for direction of arrow with straight lines of path
	(c)	(i) to (iii)  (iv) 20°	[1] for normal [1] for angle *i* (20°) [1] for reflected ray with arrow (correct angle of 20°)
	(d)	Red, orange, yellow, green, blue, indigo, violet	[1] No mark for wrong arrangement of colours

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]* • Humans with special characteristics may be created	[2]

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		• 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			[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 cm^3 = 40 cm^3 Volume of 1 marble = 40 / 10 = 4 cm^3	[1]
	(b)	Density = 8 / 4 = 2 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]

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