Name: _____ Reg. No: _____ Class: Sec 2/1

CLEMENTI WOODS SECONDARY SCHOOL
MID-YEAR EXAMINATION 2012

GENERAL SCIENCE

Secondary 2 Express

2 Hours

9 May 2012

READ THESE INSTRUCTIONS FIRST

Write your name, register number and class on all the work you hand in.

Write in dark blue or black pen.

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

1. This paper consists of Sections A, B and C.

2. Section A: Answer all questions. For each question, there are four possible answers, **A**, **B**, **C** and **D**. Choose the **one** you consider correct and shade your choice with a soft pencil on the answer sheet.

3. Sections B and C: Answer all questions in the spaces provided.

4. Hand in the answers to Sections A, B and C separately.

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

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Section A – 30 marks
Answer **all** questions.

1 Mercury is a silver liquid at room temperature. It is a good heat conductor.

Which of the following correctly describes the particles of mercury at room temperature?

A The particles of mercury are silver in colour.
B The particles of mercury are good heat conductor.
C There is a lot of space between the particles of mercury.
D The particles of mercury can slide past each other.

2 A substance consists of particles that are close together. The average speed of the particles gradually increases and the space between particles increases slightly.

Which of the following best describes the substance?

A a solid expands on heating
B a solid being melted
C a liquid expands on heating
D a liquid being heated

3 One molecule of ammonia consists of one atom of nitrogen and three atoms of hydrogen.

Which of the following gives the correct representation for 3 molecules of ammonia?

A NH_3
B $3HN_3$
C 3NH3
D $3NH_3$

4 Which of the following is **not** made up of molecules of a compound?

A phosphorus
B ammonia
C dry ice
D water

5 Which substance is a ductile element that conducts heat?

A Cu
B Ca
C C
D K

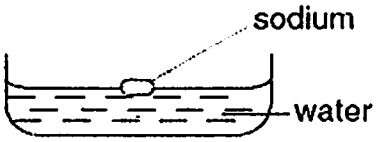
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6 A material can only be used as a filament in a light bulb if it remains solid at extremely high temperatures and conducts electricity.

Which element has properties that make it suitable for this use?

A mercury
B argon
C tungsten
D copper

7 When sodium reacts with water, a solution and a gas are produced.



What is the name of the gas that is produced?

A hydrogen
B sodium chloride
C sodium hydroxide
D carbon dioxide

8 Which of the following is an example of combustion?

A calcium carbonate → calcium oxide + carbon dioxide
B carbon + water → carbon dioxide
C sugar → carbon + water
D magnesium + oxygen → magnesium oxide

9 Consider the solubility of three salts at 20 °C :

salt	solubility/ g per 100 g of water
copper chloride	73
sodium chloride	36
potassium chloride	34

At 20 °C, which of the following gives a saturated solution?

A 34 g of potassium chloride in 50 g of water
B 36 g of sodium chloride in 100 g of water
C 17 g of potassium chloride in 50 g of water
D 37 g of copper chloride in 100 g of water

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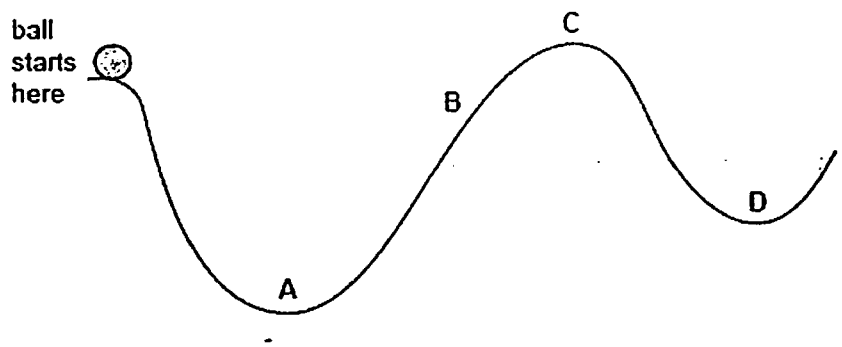
10 The **Singapore Sling** is a cocktail that was developed sometime before 1915 by Ngiam Tong Boon, a bartender working at the Long Bar in Raffles Hotel Singapore. The original recipe used gin, Cherry Heering, Bénédictine and fresh pineapple juice, primarily from Sarawak pineapples which enhances the flavour and creates a foamy top.

http://en.wikipedia.org/wiki/Singapore_Sling

Which one of the following statements is true about the Singapore Sling?

A It is a compound made up of different elements.
B It is a mixture made up of different compounds.
C It is a mixture that does not have the properties of pineapple juice.
D It is an element that cannot be broken down by physical method.

11 A ball is released from rest and rolls down a track from the position shown.



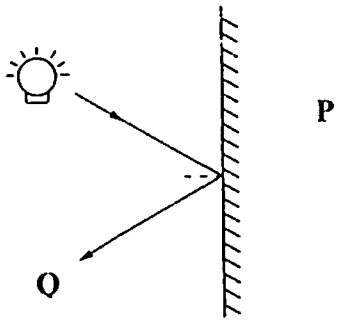
At which labelled point, **A**, **B**, **C** or **D**, does the ball have the most kinetic energy?

12 What is the energy conversion when a handphone battery is being charged?

A chemical potential energy → electrical energy
B sound energy → chemical potential energy
C electrical energy → chemical potential energy
D electrical energy → sound energy

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13 A light ray from the lighted lamp is incident on a plane mirror as shown.

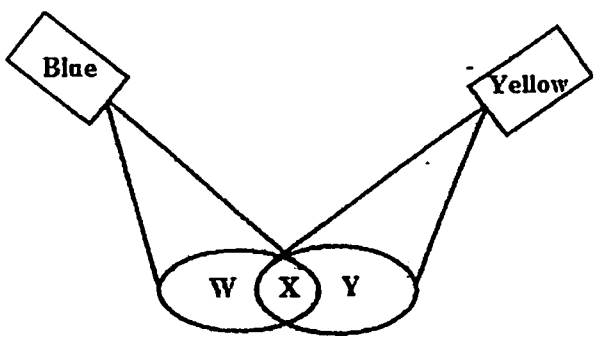


Which of the following is / are correct?

(1) The image is formed at **P** and is virtual.
(2) The image is formed at **Q** and is upright.
(3) The light ray at **Q** appears to come from point **P**.

A (1) only
B (2) only
C (1) and (3) only
D (1) and (2) only

14 Two different lights, blue and yellow, are mixed as shown.



What are the colours at regions **W**, **X** and **Y**?

	W	X	Y
A	blue	green	yellow
B	yellow	white	blue
C	blue	white	yellow
D	yellow	black	blue

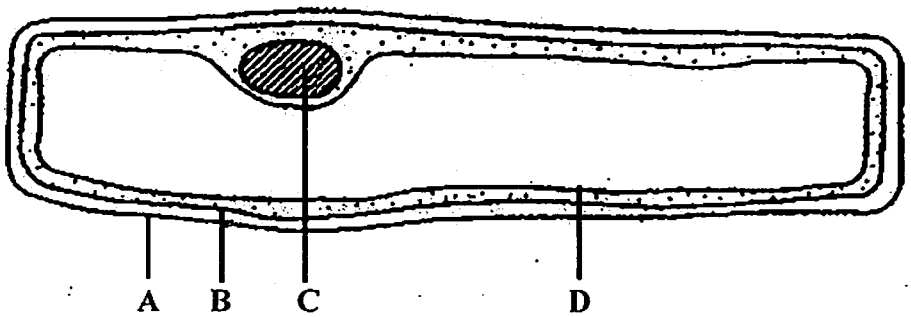
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15 A length of copper wire, coiled around a core, is used as an electromagnet.

Which combination produces the strongest electromagnet?

	number of turns	core
A	many	steel
B	many	soft-iron
C	few	copper
D	few	soft-iron

16 The diagram shows a cell from the epidermis of an onion.



Which labelled structure controls the transfer of substances into and out of the cell?

17 The diagram shows an animal cell and a plant cell.



Which parts are found in both cells?

A cell membrane and cell wall
B cell wall and sap vacuole
C sap vacuole and nucleus
D nucleus and cell membrane

18 The table shows some characteristics of four types of cell.

Which cell could be a root hair cell?

	nucleus	chloroplast
A	✓	✓
B	✓	×
C	×	✓

key
✓ = present
× = absent

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D	×	×

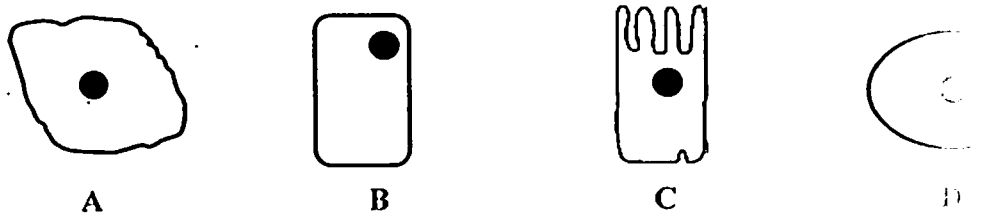
19 Cells are known as the building blocks of organisms.

Which of the following correctly shows this statement?

A cell→ tissue→ organ→ system→ organism
B cell→ tissue→ system→ organ→ organism
C cell→ organ→ system→ tissue→ organism
D cell→ system→ tissue→ organ→ organism

20 The diagrams show four cells, each having the same volume.

Which cell is adapted to absorb nutrients from its surrounding most rapidly?



A B C D

21 The table shows the concentrations of mineral salts inside and outside a root hair

Which will cause mineral salts to move into the cell by active transport?

	mineral salt concentration inside cell (%)	mineral salt concentration outside cell (%)
A	30	40
B	60	60
C	20	60
D	50	30

22 Glucose produced from the digestion of starch is taken up by the cells lining the

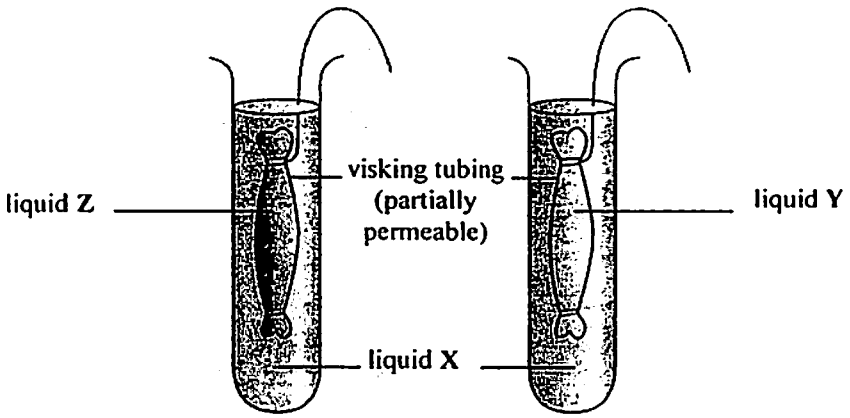
How does the glucose move?

high concentration of glucose	outside the
low concentration of glucose	inside the

A by active transport up a concentration gradient
B by active transport down a concentration gradient
C by diffusion up a concentration gradient
D by diffusion down a concentration gradient

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23 An apparatus was set up as shown.



After some time had elapsed, the visking tubing containing liquid Y collapsed while the tubing containing liquid Z was firm and hard.

Which one of the following could be a correct description of the liquids at the start of the experiment?

	liquid Z	liquid X	liquid Y
A	25% sucrose solution	10% sucrose solution	water
B	water	25% sucrose solution	10% sucrose solution
C	10% sucrose solution	water	25% sucrose solution
D	water	10% sucrose solution	25% sucrose solution

24 Which of the following is the correct function of blood platelets?

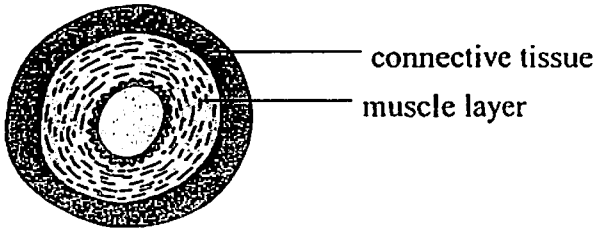
A It is needed for blood to clot.
B It destroys damaged body cells.
C It transports oxygen.
D It destroys bacteria.

25 What substance does phloem transport?

A carbon dioxide
B oxygen
C sugar
D water

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26 The diagram shows a cross-section through a human blood vessel.



What could the blood vessel be?

A an artery
B a capillary
C a vein
D a xylem vessel

27 The table shows the enzymes and products of four different types of food.

What of the following is incorrect?

	food type	digestive enzyme	product
A	amylase	maltase	glucose
B	protein	protease	peptides
C	starch	amylase	maltose
D	maltose	maltase	glucose

28 Both starch and protein consist of large molecules made from smaller basic units.

Which basic units form these molecules?

	starch	protein
A	glucose	fatty acids
B	fatty acids	maltose
C	glucose	amino acids
D	maltose	amino acids

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29 The table shows the results of food tests carried out on a fruit.

test	Benedict's	biuret	ethanol	iodine
result	positive	positive	negative	negative

What did the fruit contain?

A fat and reducing sugar
B fat and starch
C protein and starch
D protein and reducing sugar

30 Four drops of cooking oil were added to 2 cm^3 of ethanol in a clean, dry test-tube. The tube was shaken for a few seconds and 2 cm^3 of water were added.

What would be observed?

A a brick-red precipitate
B a cloudy white emulsion
C a clear solution
D a pink colour

End of Section A

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MID-YEAR EXAMINATION 2012

GENERAL SCIENCE
Secondary 2 Express

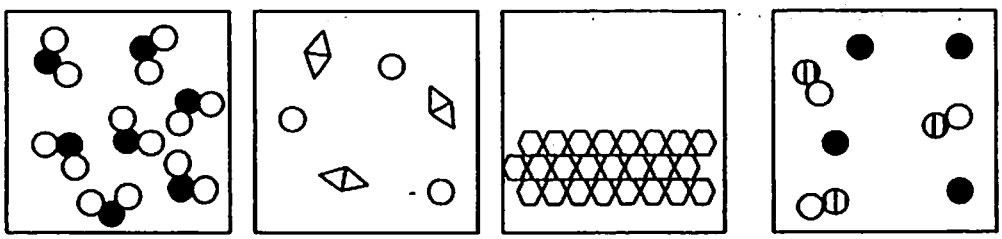
Section A	Section B	Section C	Total marks
/ 30	/ 50	/ 20	/ 100

Section B - 50 marks

Chemistry and Physics

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

31 **(a)** Fig. 31.1 represents the particles in substances **I, II, III** and **IV**.



I **II** **III** **IV**

Fig. 31.1

Write down the substance that contains

(i) an element only, ...

(ii) a mixture of an element and a compound .....

(iii) a compound of two elements only.....

[3]

(b) **(i)** Name a diatomic molecule.

[1]

.....

(ii) State the chemical symbol of the element in the diatomic molecule named in **(b)(i)**.

[1]

.....

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32 At room temperature, substance X is a grey solid and substance Y is a yellow powder. When mixed together, X and Y can be separated using a magnet. However, when heated, the resulting substance Z is no longer attracted to a magnet.

(a) What are substances X, and Y?

[2]

.....

.....

(b) Which substance, X or Y, is attracted by the magnet? Explain why.

[1]

.....

.....

(c) Which substances X, Y or Z, is a compound? Explain your answer.

[1]

.....

.....

(d) Write down one difference between X and Z.

[1]

.....

.....

33 Fig. 33.1 represents the arrangement of particles in a solid

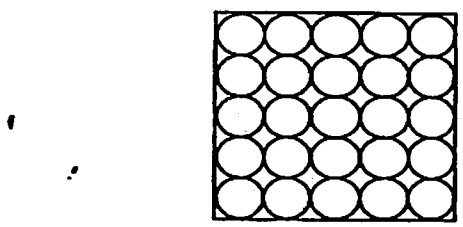


Fig. 33.1

(a) Describe the movement of the particles in the solid.

[1]

.....

.....

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(b) How does this movement of the particles change as the solid is heated until its melting point?

[2]

.....

.....

.....

.....

(c) Equal masses of steam and of water contain the same number of molecules. Explain why the volume of the steam is much greater than that of the water.

[2]

.....

.....

.....

.....

34 Lead nitrate and sodium bromide are colourless solution. When lead nitrate is added to sodium bromide, the resulting mixture is a colourless solution of sodium nitrate with yellow precipitate of lead bromide. The mixture is filtered.

(a) What is the name given to the mixture formed?

[1]

.....

(b) Write a word equation to represent the above reaction.

[2]

.....

(c) Name the substances collected as residue and filtrate.

[2]

.....

.....

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35 Fig. 35.1 shows an electricity generating station.

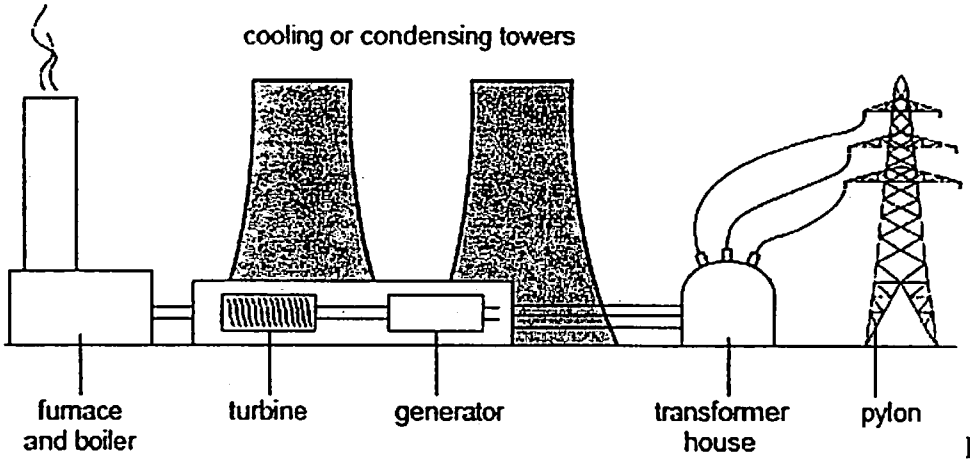


Fig. 35.1

(a) Name two fossil fuels which could be burned in the furnace to heat water in the boiler.

1. .....

2. .....

[2]

(b) Complete the energy transfer statements below.

In the furnace..... energy is converted into heat energy. In the turbine, the energy in the steam is converted into the ..... energy of the turbine.

The generator converts ..... energy into ..... energy.

[3]

36 In this question, drawing should be done carefully using a pencil.

Fig. 36.1 shows a ray of light striking mirror 1 at point X.

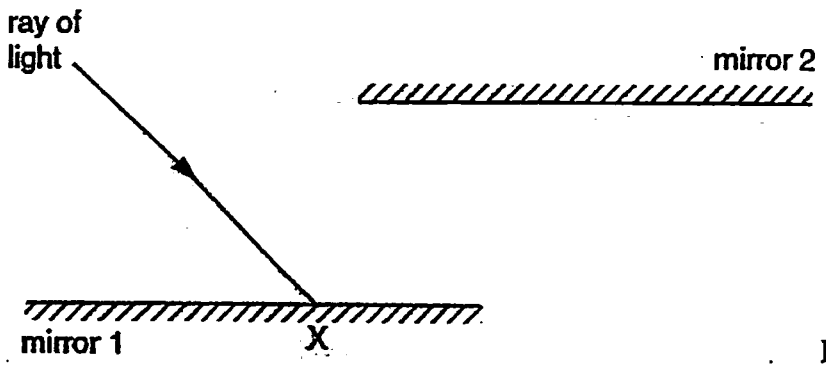


Fig. 36.1

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(a) On Fig. 36.1,
(i) draw the normal at X,
(ii) draw the ray reflected from mirror 1,
(iii) mark the angle of incidence and label it *m*,
(iv) mark the angle of reflection and label it *f*.

[4]

(b) Mirror 2 is parallel to mirror 1. The reflected ray from mirror 1 strikes mirror 2. Compare the direction of the ray reflected from mirror 2 with the incident ray at X. You may do a further construction if you wish. Complete the sentence below.

[1]

The reflected ray from mirror 2 is .....

.....

37 Fig. 37.1 shows a children's playground. A child of mass 30 kg climbs up a concrete slide of height 2.3 m. He slides down the slope that has a length of 5 m. At the end of the slope, which is 0.3 m above the ground, his velocity is 4 m/s.

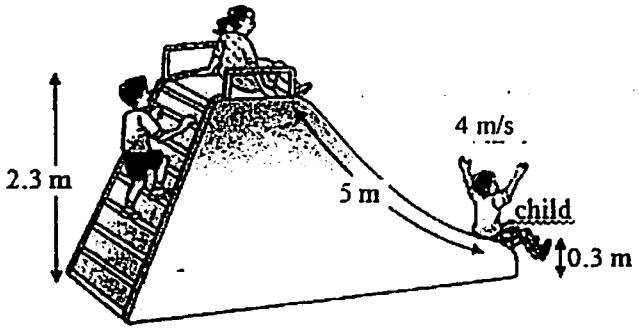


Fig. 37.1

(a) Calculate his potential energy (PE)
(i) at the top of the slide, and
(ii) at the end of the slide.

[3]

PE at the top = ... J

PE at the end = ... J

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(b) Find his kinetic energy (KE) at the end of the slope.

[2]

KE = ... J

(c) **(i)** State the principle of conservation of energy.

[2]

.....

.....

.....

(ii) Write down the conversion of energy as the child slides from the top to the bottom of the slide.

[2]

.....

(iii) Find the amount of energy that is converted to other forms of energy as the child slides from the top to the bottom of the slide.

[1]

amount of energy = ... J

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38 In an experiment to observe the refraction of light in glass, a student shone a ray of red light on a thick rectangular glass block as shown in Fig. 38.1. He marked, on a sheet of white paper placed underneath the block, the path of the incident ray and the emergent ray.

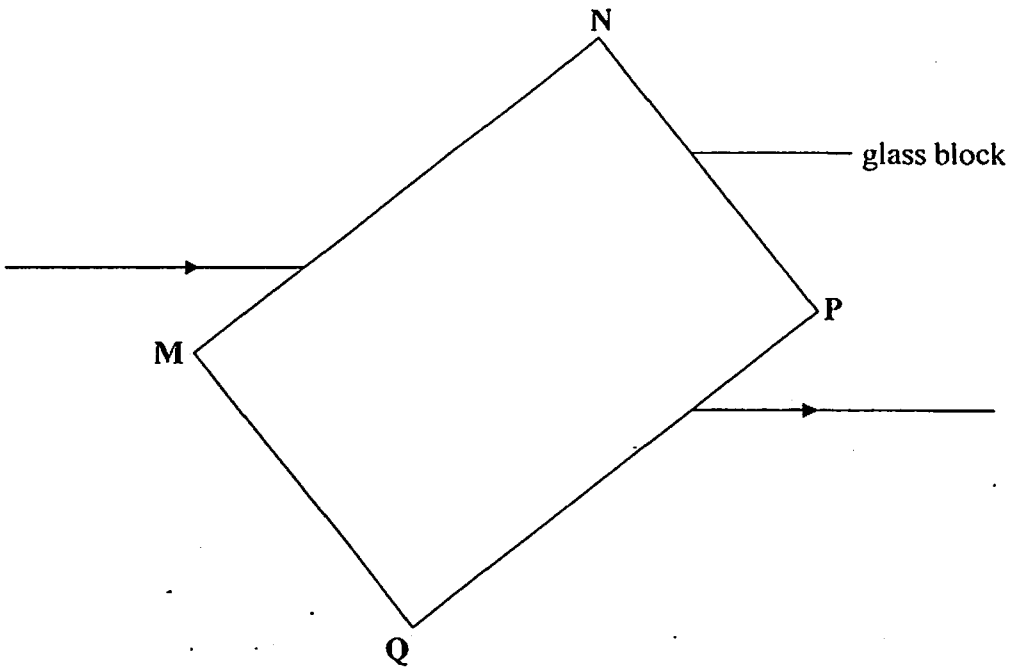


Fig. 38.1

(a) Complete Fig. 38.1 to show the normal for the incident ray on side MN and the path of the refracted ray.

[2]

(b) (i) On Fig. 38.1 indicate the angle of incidence with letter *d* and angle of refraction with letter *f*.

[2]

(ii) Measure and record the values of the angles.

[2]

d = ...

f = ...

(c) Some of the incident rays are also reflected. On Fig. 38.1, draw accurately the path of the reflected light.

[2]

(d) State the size of the angle of reflection and the angle of emergence.

[2]

angle of reflection = ...

angle of emergence = ...

End of Section B

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Name : _____( ) Class: Sec 2/1

CLEMENTI WOODS SECONDARY SCHOOL
MID-YEAR EXAMINATION 2012

GENERAL SCIENCE
Secondary 2 Express

Section A	Section B	Section C	Total marks
/ 30	/50	/20	/ 100

Section C - 20 marks

Biology

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

39 Fig. 39.1 shows the structure of a plant cell as seen through a light microscope.

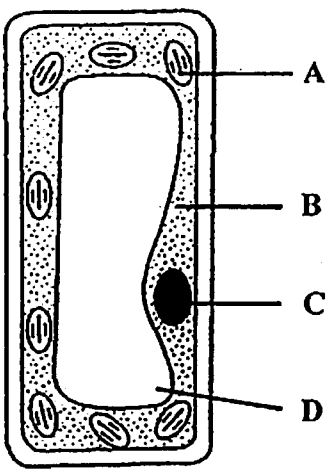


Fig. 39.1

(a) (i) Identify the structures labelled **A** and **B**. [2]

A.....

B.....

(ii) Identify structure **C** and state its function. [2]

.....

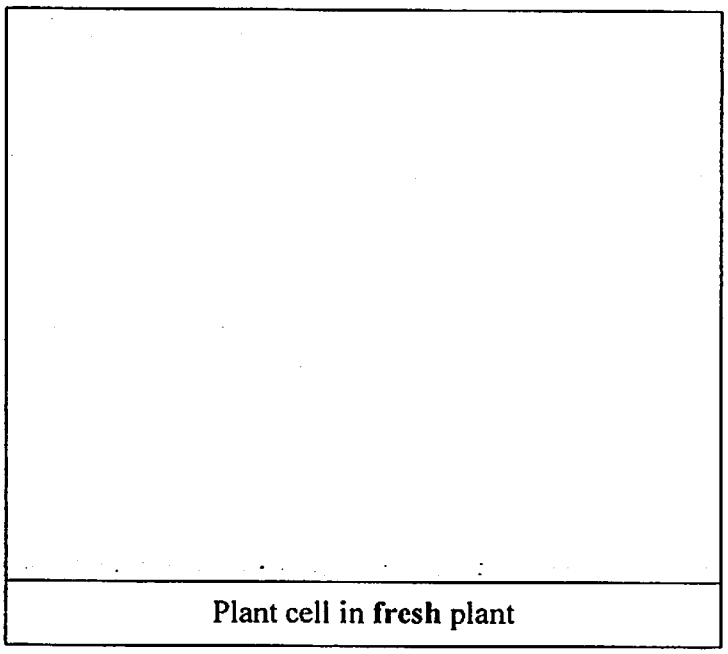
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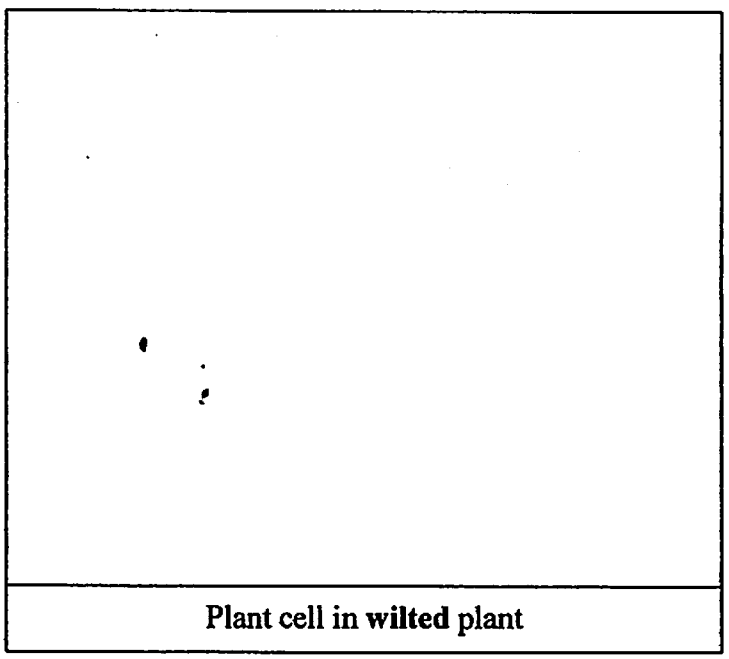
(b) Two plants have been kept out on a windowsill. One looks fresh and is kept in a vase full of water. The other is wilted and kept in an empty dry vase.

Draw a cell from each of the plants to show their conditions. You **must** label the cell membrane and cell wall in both diagrams.

[3]



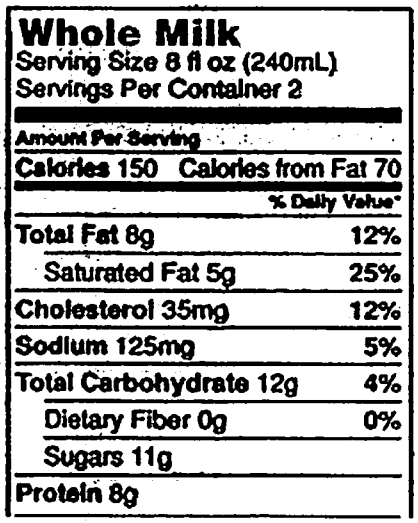
Plant cell in **fresh** plant



Plant cell in **wilted** plant

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40 Fig. 40.1 shows information taken from a carton of milk.



Whole Milk
Serving Size 8 fl oz (240mL)
Servings Per Container 2

Amount Per Serving	
Calories 150	Calories from Fat 70
	% Daily Value*
Total Fat 8g	12%
Saturated Fat 5g	25%
Cholesterol 35mg	12%
Sodium 125mg	5%
Total Carbohydrate 12g	4%
Dietary Fiber 0g	0%
Sugars 11g	
Protein 8g	

Fig. 40.1

(a) Which nutrient will provide the most energy per gram?

[1]

.....

In September 2008, and in recent times, several companies in China were implicated in a scandal involving milk and infant formula which had been contaminated with melamine.

(b) Melamine has high nitrogen content, and when added to milk can cause the amount of nutrient **X** to appear higher than the actual amount.

What is nutrient **X**?

[1]

.....

(c) Two samples of white powder have been brought to your lab. One is pure melamine. The other is milk powder contaminated with melamine.

Which food test would you use to differentiate the two powders?

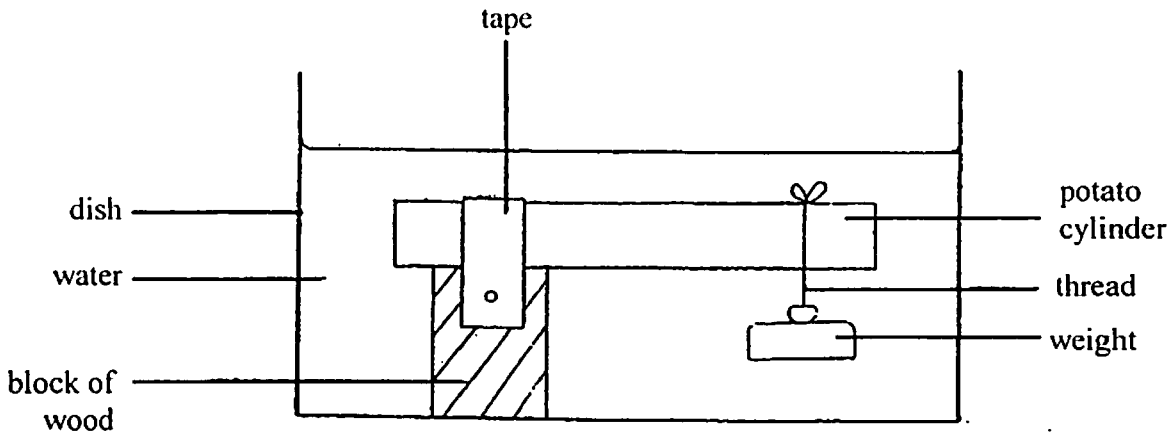
[1]

.....

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41 An experiment was carried out to investigate the effect of concentrated salt solution on potato tissue.

A cylinder was cut from a potato and one end was attached with a tape to a block of wood. This was then fixed to the base of a dish and a weight was tied to the other end of the cylinder. The dish was filled with tap water (dish A). The apparatus is shown in Fig. 41.1.

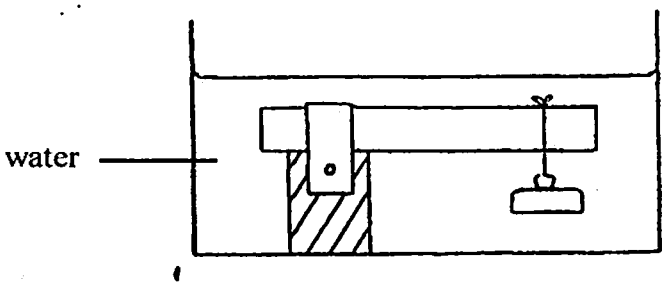


Dish A at start

Fig. 41.1

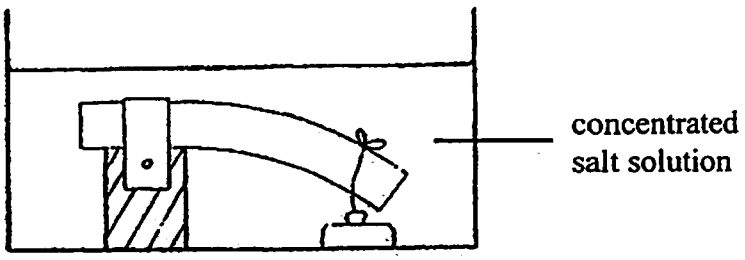
A second cylinder of the same size was cut from the potato, and the apparatus was set up in the same way, except that the dish was filled with concentrated salt solution (dish B).

Both dishes were left for one hour. The appearance of each cylinder after one hour is shown in Fig. 41.2 and Fig. 41.3.



Dish A after one hour

Fig. 41.2



Dish B after one hour

Fig. 41.3

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(a) Explain the difference between the appearances of the potato cylinder in dish A and the potato cylinder in dish B after one hour.

[8]

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(b) From the results of the experiment, deduce the property of the cell membrane of the potato cells and explain your deduction.

[2]

.....

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.....

.....

End of paper

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MID-YEAR EXAMINATION 2012

GENERAL SCIENCE

SECTION B - PHYSICS/CHEMISTRY

SECTION C - BIOLOGY

Secondary 2 Express

2 Hours

9 May 2012

Section A – 30 marks
1 mark per question

1	D	**5**	A	**9**	A	**12**	C	**15**	B
2	D	**6**	C	**10**	B	**13**	C	**16**	B
3	D	**7**	A	**11**	A	**14**	C	**17**	D
4	A	**8**	D					**18**	B

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

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Section B - 50 marks

Chemistry and Physics

31 (a) (i) III
(ii) IV
(iii) I
[3]

(b) (i)(ii) Oxygen gas O_2/ hydrogen gas H_2/ nitrogen gas N_2 [1]

32 (a) X is iron (filings)
Y is sulfur
[2]

(b) X is attracted as it is magnetic [1]

(c) Z is a compound as it has colour different from X and Y/ cannot be attracted by magnet [1]

(d) X is an element while Z is a compound OR
X is attracted by magnet but Z is not attracted by magnet. [1]

33 (a) The particles in a solid can only vibrate within their fixed positions. [1]

(b) When the temperature reaches the melting point, the particles gained enough energy to overcome the forces of attraction between them 1m
and break free from the neighbouring particles. 1m
[2]

(c) Gaseous steam molecules possess more kinetic energy than water molecules. ½ m
The forces of attraction between the gas particles are very weak and ½ m
the gas molecules are spaced out far apart as compared to those in water, 1m
thus the volume of steam is much greater than that of water.
[2]

34 (a) suspension [1]

(b) Lead nitrate + sodium bromide → sodium nitrate + lead bromide [2]

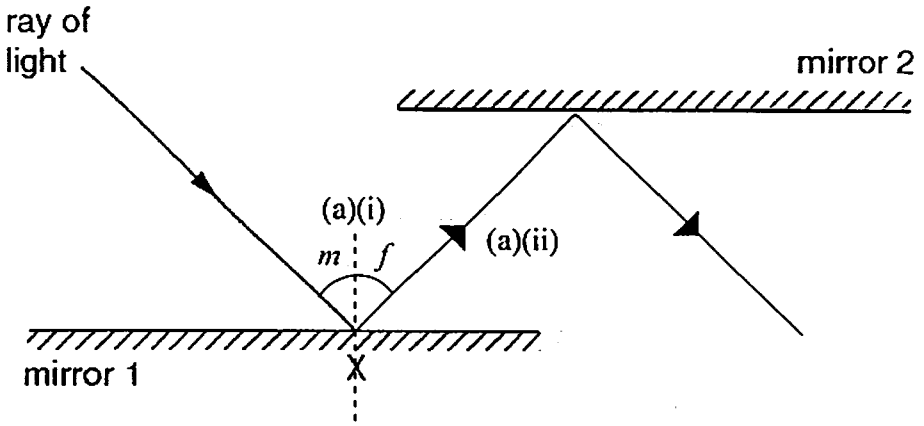
(c) residue – lead bromide
Filtrate – sodium nitrate
[2]

35 (a) 1. oil
2. coal
[2]

(b) chemical
Kinetic
Kinetic electrical
[3]

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36 [4]



(b) The reflected ray from mirror 2 is parallel to the incident ray. [1]

37 (a) (i) PE top = mgh = 30 x 10 x 2.3 = 960 J [3]
(ii) PE end = mgh =30 x 10 x 0.3 = 90 J
1m @ for working ½ @ for correct answer with unit . wrong unit – ½ m

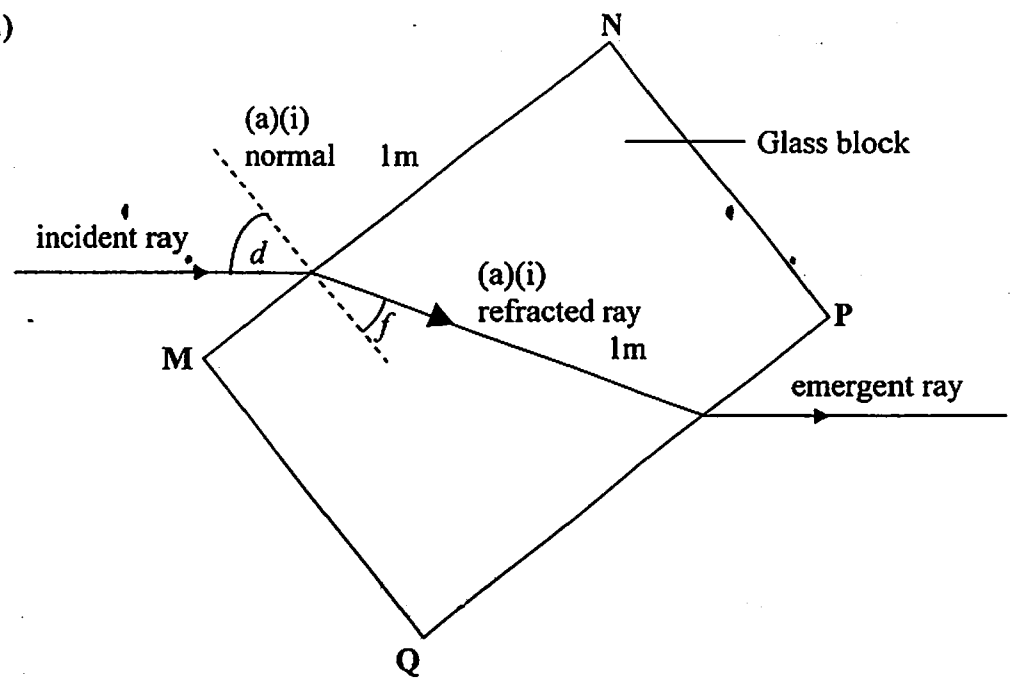
(b) $KE = \frac{1}{2} mv^2 = \frac{1}{2}\ 30 \times 16 = 240$ J [2]

(c) (i) Energy cannot be created and destroyed, [2]
Can be converted from one form to another,
Total energy remains constant

(ii) PE → PE+ KE + heat [2]

(iii) Heat = 960 – 240 – 90 = 640 J [1]

38 (a) [2]



(b)(i)
(ii) d = f = [2]
(c) correct angle 1m arrow 1m [2]

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(d) angle of reflection – same as (b)(ii) ecf
angle of emergence – same as (b)(ii) ecf [2]
[2]

Section C - 20 marks

Biology

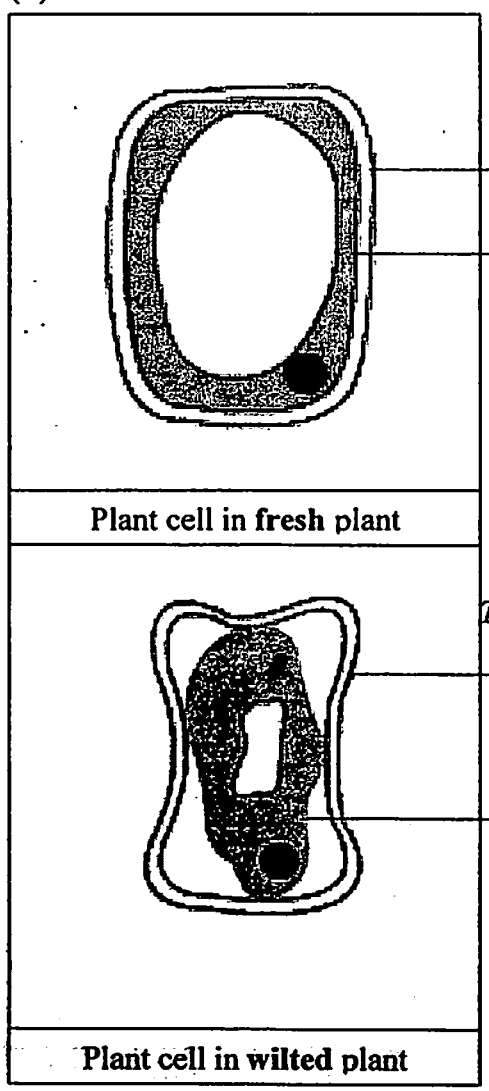
Answer **all** questions in the spaces provided.

39 (a) (i) [2]

A- *chloroplast*
B- *cytoplasm*

(ii) *Structure C is the nucleus.* [1]
It contains hereditary materials called chromosomes; needed for cell reproduction; controls ALL activities of the cell. [any one for 1 mark] [2]

(b) [1]



[3]

Neatness [1]
Correct labelling with parallel lines [1]
Turgid cell in fresh plant and flaccid/plasmolysed cell in wilted plant [1]

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40 **(a)** *fat* [1]

(b) *Protein* [1]

(c) *Biuret's test* [1]

41 **(a)** *In dish A , water in the dish has a higher water potential than the cytoplasm and cell sap of the potato cells.* [1] [8]

Therefore more water molecules will move into the potato cells, [1]
by osmosis across the partially permeable cell membrane. [1]
The potato cells become turgid, and therefore the cylinder becomes firm and is able to support the weight [1]

In dish B , the concentrated salt solution in the dish has a lower water potential than the cytoplasm and cell sap of the potato cells. [1]

Therefore more water molecules will move out of the potato cells, [1]
by osmosis across the partially permeable cell membrane. [1]
The potato cells become flaccid, and therefore the cylinder becomes soft and is unable to support the weight [1]

(b) *It can be deduced that the cell membrane of the potato cell is partially permeable.* [1]
The membrane allows small water molecules to move in and out of the cell by osmosis, but prevents larger molecules such as salt from entering or leaving the cell. [1]

[2]

End of Paper

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Class	Candidate Name	Register Number

FIRST TOA PAYOH SECONDARY SCHOOL

MID-YEAR EXAMINATION 2012

Secondary Two Express

Lower Sec Science **4th May 2012**

Paper 1 **30 minutes**

Additional Materials: Multiple Choice Answer Sheet

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, highlighters, glue or correction fluid.
Write your name, register number and class on the Answer Sheet in the spaces provided.

There are **twenty** 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.
Any rough working should be done in this booklet.
A copy of the Periodic Table is attached on the last page.

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Multiple Choice Questions (30 Marks)

Answer **All** questions on the Multiple Choice Answer Sheet provided

1 Which of the following equations are examples of combination?

I calcium carbonate ⟶ calcium oxide + carbon dioxide

II sodium + water ⟶ sodium hydroxide + hydrogen

III sugar ⟶ carbon + water

IV carbon + oxygen ⟶ carbon dioxide

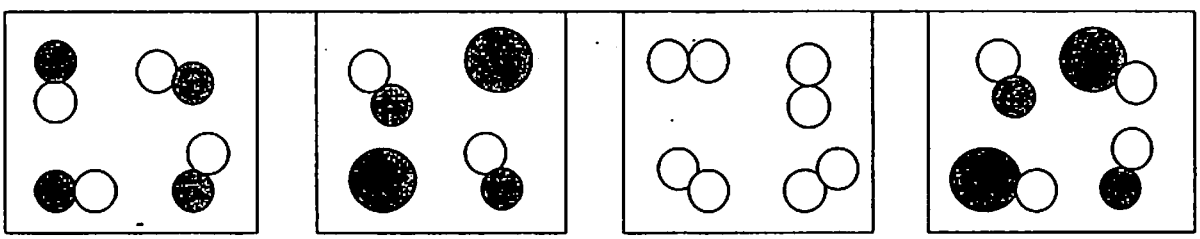
A I and II only

B I and III only

C II and IV only

D I, II and III only

Use the following diagram for questions **2** and **3.**



A B C D

In the diagram, each circle represents an atom. Circles of different colours and sizes represent different atoms.

2 Which diagram represents a mixture of compounds?

3 Diagram **A** represents a substance. Which of the following are two possible substances that diagram **A** may represents?

A O_2, HCl

B CO, HCl

C He, Br_2

D Cl_2, O_2

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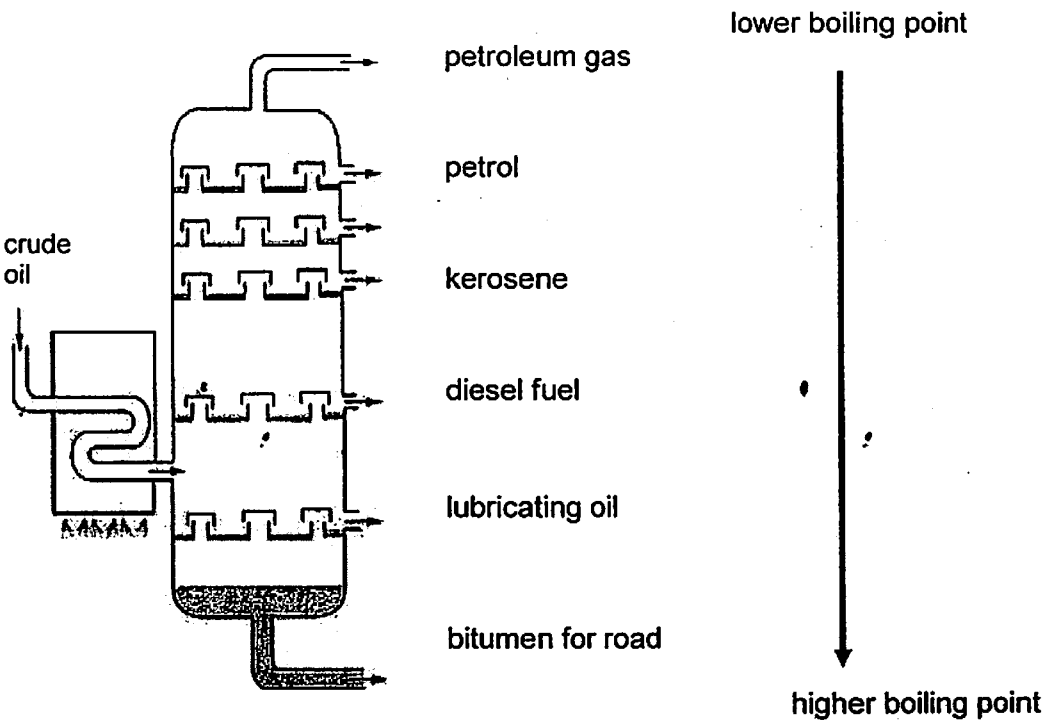
4 Which of the following examples given is **incorrectly** matched to the type of mixture stated?

	type of mixture	example
A	solid – solid	copper
B	liquid -liquid	alcoholic drinks
C	solid - liquid	Milo drink
D	gas - liquid	soda drink

5 Which of the following separation techniques is used to obtain NEWater in Singapore?

A filtration
B reverse osmosis
C simple distillation
D fractional distillation

6 The diagram below shows the fractional distillation of crude oil in an oil refinery.



Which fraction would be distilled over first?

A petrol
B kerosene
C petroleum gas
D bitumen for road

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7 Which of the following actions could be used to make a solution more concentrated?

A Heat the solution.

B Add more solvent.

C Place the solution in a cool place.

D Stir the solution for a longer period of time.

8 The table below shows some differences between a solution and a suspension. Which one correctly describes the difference between a solution and a suspension?

	solution	suspension
A	non-homogeneous	homogeneous
B	solid particles settle at the bottom	no solid particles settle at the bottom
C	does not allow light to pass through	allow light to pass through
D	no solid particles remain on the filter paper after filtration	solid particles are obtained on the filter paper after filtration

9 In which of the following will the 5 g of rock sugar dissolve in 100 g of water the fastest?

	form	Temperature / °C
A	small pieces	40 °C
B	small pieces	80 °C
C	big lump	40 °C
D	big lump	80 °C

10 A man suffering from an excess of acid in his stomach has no indigestion tablets. Which substance could he now take to lower this acidity?

A asprin (pH 6)

B salt water (pH 7)

C lemon juice (pH 5)

D bicarbonate of soda (pH 8)

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11 Which of the following substances is used in car batteries?

A sulfuric acid
B hydrochloric acid
C limewater
D sodium hydroxide

12 Which of the following plants' extract **is not suitable** to be used as an indicator?

plant	colour of original extract	colour change in lemon juice	colour change in oven cleaner
A	purple	pink	green
B	green	yellow	yellow
C	pink	pink	yellow
D	orange	red	green

13 Which of the following changes gives out heat?

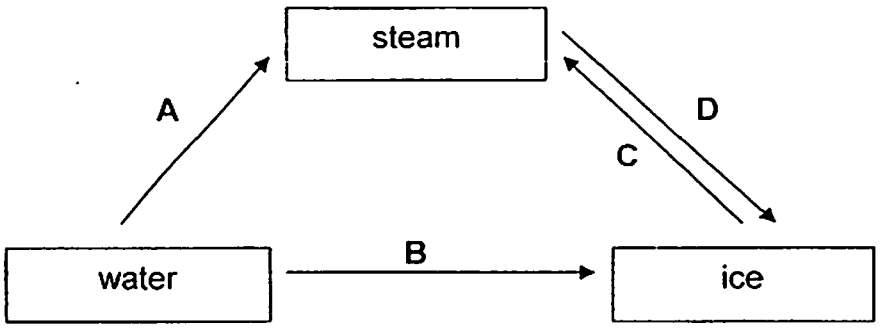
A evaporation
B burning of petrol
C sublimation of iodine
D expansion of a piece of copper rod

14 Which of the following does **not** involve a chemical change?

A photosynthesis
B iron becomes rusty
C bread turns mouldy
D dry ice turns into carbon dioxide

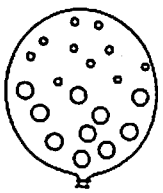
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15 Which change, A, B, C or D involves freezing?

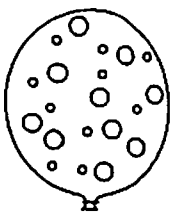


16 Which of the following diagrams shows the arrangement of particles inside a balloon filled with a mixture of hydrogen and nitrogen?

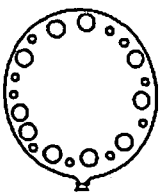
A



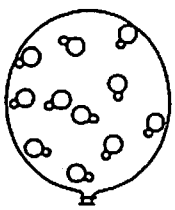
B



C



D



17 Which of the following substances has particles that vibrate in their fixed positions at 30 °C?

	melting point (°C)	boiling point (°C)
A	-189	-186
B	-10	58
C	-6	225
D	36	344

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18 Which of the following statements is **incorrect**?

A Element are made up of atoms.

B Atoms cannot be created or destroyed.

C Atoms of the same elements have the same size and mass.

D Atoms of different elements have different number of protons but equal number of electrons.

19 What is the **correct** charge on each particle in an atom?

	proton	neutron	electron
A	positive	no charge	no charge
B	positive	no charge	negative
C	no charge	negative	postive
D	negative	positive	no charge

20 Which of the following is correct about aluminium carbonate, $Al_2(CO_3)_3$?

	number of elements	number of atoms
A	3	12
B	3	14
C	4	13
D	4	15

-End of Paper –

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Group																	
I	II										III	IV	V	VI	VII	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	98 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	226 Ra Radium 88	227 Ac Actinium 89 +															

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

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

Key: a / X / b — 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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