Name: …….. ( ) **Class:** …….

ASSUMPTION ENGLISH SCHOOL
END OF YEAR EXAMINATION 2014

LOWER SECONDARY SCIENCE
BOOKLET A

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LEVEL:	Sec 2 Express	**DATE:**	2 October 2014
CLASSES:	Sec 2/1, 2/2	**DURATION:**	2 hours (For booklets **A** and **B**)

Additional Materials provided: 1 sheet of OAS paper

INSTRUCTIONS TO CANDIDATES
Do not open this booklet until you are told to do so.

Write your NAME, INDEX NUMBER and CLASS at the top of this page and on the OAS paper. **Shade your index number on the OAS** paper.

This paper consists of 3 sections.

Booklet A:	Section A - Multiple-Choice Questions
Booklet B:	Section B - Short Structured Questions
	Section C - Long Structured Questions

SECTION A (30 marks)
Multiple-Choice Questions
There are 30 questions in this section. Answer **all** questions. For each question, there are four possible answers A, B, C and D. **Choose the correct answer and record your choice in soft or 2B pencil on the OAS paper provided. DO NOT fold or bend the OAS paper.**

At the end of the examination, hand in your OAS paper, Booklets **A** and **B** separately.
A copy of the Periodic Table is printed at the end of Booklet **B**.

This Question Booklet consists of 12 printed pages including this page.

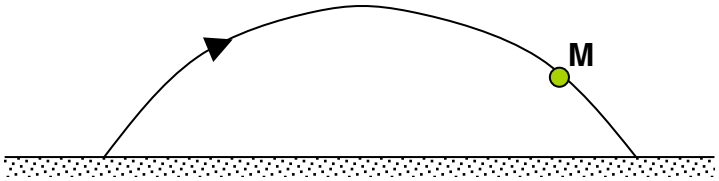
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Section A: Multiple-Choice Questions (30 marks)

There are **thirty** questions in this section. 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 on the OAS paper in soft pencil.

1 The diagram shows the path of a golf ball as it travels through the air. Which one correctly describes the gravitational potential energy and kinetic energy of the ball at point **M**?



	gravitational potential energy	kinetic energy
A	decreasing	decreasing
B	decreasing	increasing
C	increasing	decreasing
D	increasing	zero

2 Which is **not** a reason why we should conserve energy?

A Conserving energy increases the supply of fossil fuel.

B Conserving energy results in less pollution.

C Current energy sources may not be enough to meet the increasing demand for energy.

D There is limited supply of oil and coal.

3 What causes the expansion of metals on heating?

A Increase of number of particles

B Increase of size of particles

C Increase of spaces between particles

D Increase of volume of particles

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4 Which statement about convection is **true**?

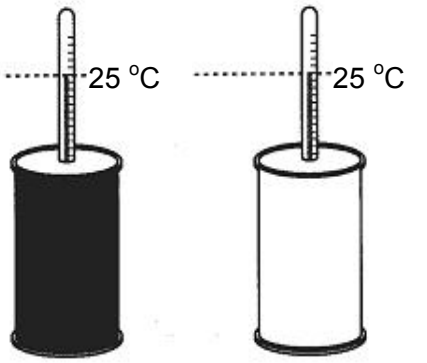
A A convection current does not require a medium for the transfer of heat energy.

B A convection current is caused by the difference in density between a hot liquid and a cold liquid.

C A convection current is caused by the movement of molecules in solids and gases.

D Convection in solids is slower than in liquids.

5 Two identically shaped cans are filled with equal amounts of water at 25 °C. One is a dull, black can while the other is a silvery, shiny can. They are placed under the sun for 10 minutes.



What can be observed after 10 minutes?

A The drop in temperature of the dull, black can is higher than that of silvery, shiny can.

B The temperature of both cans will rise by the same amount.

C The temperature of the dull, black can will rise more than that of the silvery, shiny can.

D The temperature of the dull, black can will rise less than that of the silvery, shiny can.

6 What **cannot** be changed by a push or pull acting on an object?

A mass of an object

B shape of an object

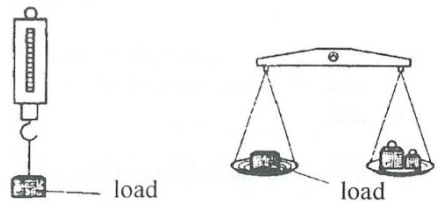
C size of an object

D speed of an object

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7 A load is placed on a balance **X** and then on a balance **Y**.

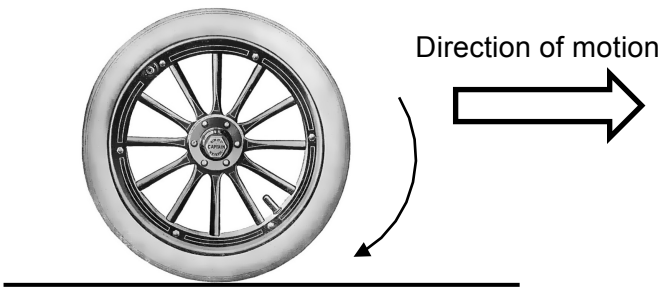
Balance **X** Balance **Y**



Which physical quantity is measured by each balance?

	Balance **X**	Balance **Y**
A	mass	force
B	mass	weight
C	weight	force
D	weight	mass

8 The diagram below shows a wheel rotating along the road, moving towards the right.



In which direction is the friction acting on the wheel?

A	→
B	←
C	↓
D	↑

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9 Brakes are used to stop a car.

What is most of the kinetic energy converted into?

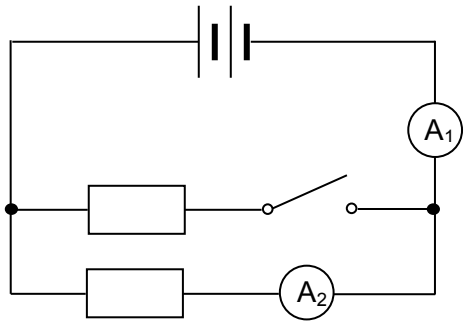
A heat energy

B light energy

C potential energy

D sound energy

10 In the circuit shown, both resistors are identical.



If the switch is closed, how will the readings of ammeters $\mathbf{A_1}$ and $\mathbf{A_2}$ change?

	reading of A_1	reading of A_2
A	increases	decreases
B	increases	no change
C	no change	decreases
D	no change	no change

11 An electric circuit contains four 3 V batteries and a 6 Ω resistor connected in series. What is the current produced in the circuit?

A 0.5 A

B 2 A

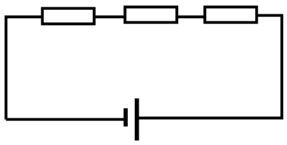
C 3 A

D 72 A

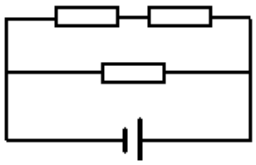
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12 Which resistor combination has the lowest effective resistance?

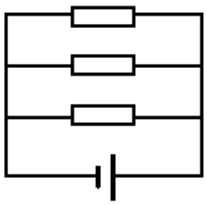
A



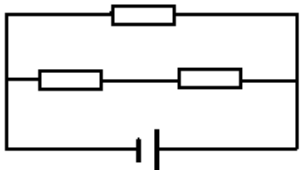
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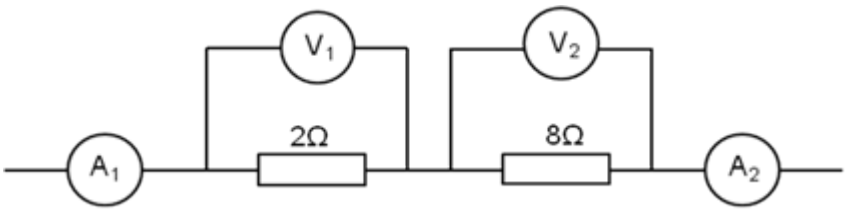
C



D



13 Current flows in two resistors connected in series as shown. $\mathbf{A_1}$ and $\mathbf{A_2}$ are the readings on the ammeters. $\mathbf{V_1}$ and $\mathbf{V_2}$ are the readings on the voltmeters.



Which of the following correctly describes the ammeter and voltmeter readings?

	ammeter readings	voltmeter readings
A	$\mathbf{A_1 < A_2}$	$\mathbf{V_1 < V_2}$
B	$\mathbf{A_1 < A_2}$	$\mathbf{V_1 > V_2}$
C	$\mathbf{A_1 = A_2}$	$\mathbf{V_1 = V_2}$
D	$\mathbf{A_1 = A_2}$	$\mathbf{V_1 < V_2}$

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14 A coil of copper wire wrapped around a core could be used as an electromagnet.
Which combination would produce the strongest electromagnet?

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

15 Which of the following is a potential consequence when a multi-socket plug adapter is used to connect many appliances to the same socket?



A The appliances will be damaged due to the higher current that flows through each appliance.

B The current drawn from the mains gets higher and overheating may occur.

C The flow of the current will be slowed down and the power to each appliance will be reduced.

D The voltage across the live and neutral wires increases and overheating may occur.

16 ……**I**…… energy can be transmitted in vacuum but ……**II**…… energy cannot.

	I	**II**
A	Heat	light
B	Light	sound
C	Sound	heat
D	Sound	light

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17 Which statement(s) about sound is correct?

I Human hearing range is from 10 Hz to 10,000 Hz

II Sound travels in the form of wave

III Speed of sound is higher in solid than liquid

A **I** only

B **I** and **II** only

C **II** and **III** only

D **I**, **II** and **III** only

18 Which parts of the ear vibrate when sound is heard?

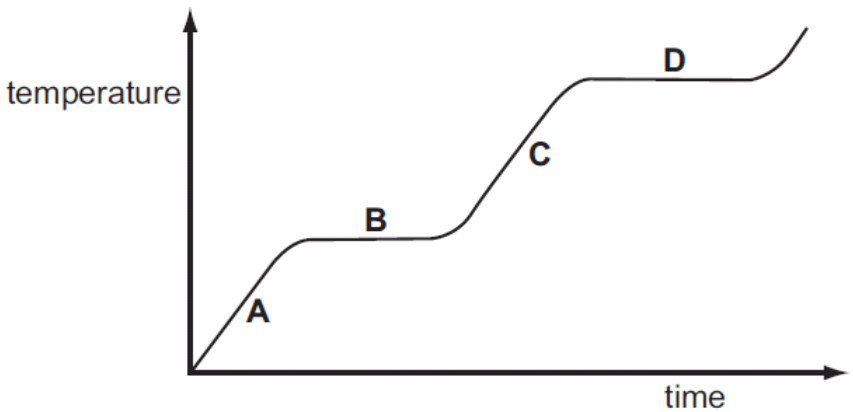
A ear bones and ear canal

B ear bones and eardrum

C eardrum and ear canal

D external ear and ear canal

19 The graph shows the change in temperature of a material as it is heated. Which part of the graph shows that the material is boiling?

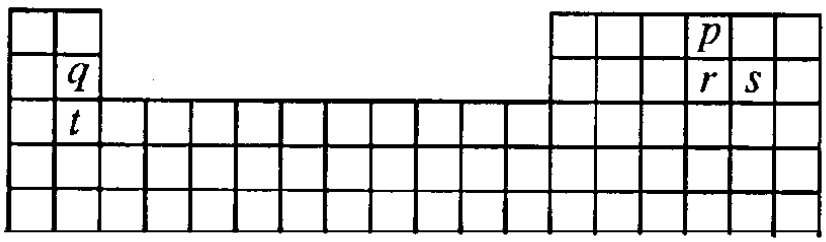


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20 During a change of physical state, how does the temperature of the substance and energy of the particles change?

	temperature of substance	energy of particles
A	changes	changes
B	changes	remains unchanged
C	remains unchanged	changes
D	remains unchanged	remains unchanged

*Questions **21** and **22** refer to the diagram below which represents part of the Periodic Table. The code letters **p**. **q**, **r**, **s**, **t** represent elements.*



21 Which pair of code letters represents non-metallic elements?

A **p** and **q**
B **p** and **r**
C **q** and **r**
D **q** and **t**

22 Which pair of code letters represents elements which are in the same period of the Periodic Table?

A **p** and **q**
B **p** and **r**
C **q** and **t**
D **r** and **s**

23 Which is not a way of checking whether a mixture is a suspension or a solution?

A Allow the mixture to stand for some time.
B Evaporate the mixture.
C Filter the mixture.
D Hold the mixture at a light source.

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24 The table below shows a list of substances and their solubility in water.

substance	solubility in water
ammonium chloride	soluble
calcium chloride	soluble
silver nitrate	soluble
barium sulfate	insoluble
lead(II) sulfate	insoluble

Which mixture can be separated into its components by adding water, stirring and filtering?

A ammonium chloride and silver nitrate

B barium sulfate and calcium chloride

C calcium chloride and silver nitrate

D lead(II) sulfate and barium sulfate

25 The table shows some information about the solubilities of three solids.

solid	solubility in water	solubility in ethanol
P	insoluble	insoluble
Q	soluble	insoluble
R	insoluble	soluble

The following steps could be taken to obtain **R** from a mixture of **P**, **Q** and **R**.

I filter
II evaporate filtrate till dryness
III add ethanol
IV add water

In what order should the steps be taken to obtain **R** from a mixture of **P**, **Q** and **R**?

A **III → I → II**

B **III → IV → I → II**

C **IV → I → II**

D **IV → III → I → II**

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26 Which pair of air pollutants is responsible for the formation of acid rain?

A carbon monoxide and nitrogen dioxide

B carbon monoxide and soot

C nitrogen dioxide and soot

D nitrogen dioxide and sulfur dioxide

27 Which situation are damages associated with acid rain?

I droughts

II erosion of stone statues and buildings

III melting of ice caps

IV threat to the life of aquatic beings

A **I** and **III**

B **I** and **IV**

C **II** and **III**

D **II** and **IV**

28 What is the colour of the resulting mixture if methyl orange, bromothymol blue and phenolphthalein are all added to a solution of pH 5?

pH value	0 2 4 6 8 10 12 14
Methyl orange	red | yellow
Bromothymol blue	yellow | blue
Phenolphthalein	colourless | red

A blue

B orange

C purple

D yellow

29 Which two particles have about the same relative mass?

A a neutron and an electron

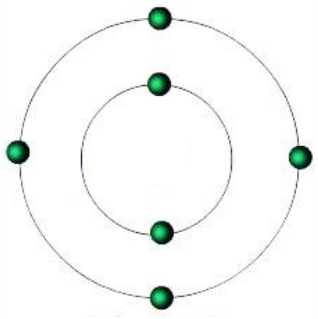
B a proton and a neutron

C a proton and an atom

D a proton and an electron

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30 If the relative atomic mass of the atom below is 12 times the relative atomic mass of a proton, how many neutrons are there in the atom?



A 4

B 6

C 8

D 12

– END OF SECTION A –

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Name: …….. ( ) **Class:** …….

ASSUMPTION ENGLISH SCHOOL
END OF YEAR EXAMINATION 2014

LOWER SECONDARY SCIENCE
BOOKLET B

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LEVEL: Sec 2 Express **DATE:** 2 October 2014

CLASSES: Sec 2/1, 2/2 **DURATION:** 2 hours
(For Booklets **A** and **B**)

Additional Materials provided: Nil

INSTRUCTIONS TO CANDIDATES
Do not open this booklet until you are told to do so.

Write your NAME, INDEX NUMBER and CLASS at the top of this page.

SECTION B (40 marks)
Short Structured Questions
Answer **all** questions. Write your answers in the spaces provided on the question paper.

SECTION C (30 marks)
Long Structured Questions
Answer all questions. Write your answers in the spaces provided on the question paper.

For Examiner's use:	
Section A	/ 30
Section B	/ 40
Section C	/ 30
Total	/ 100

At the end of the examination, hand in your OAS paper and Booklets **A** and **B** separately.
A copy of the Periodic Table is printed on page 15.

This Answer Booklet consists of 15 printed pages including this page.

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Section B: Short Structured Questions (40 marks)

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

1 Two geologists are collecting rocks from the bottom of a cliff. The rocks are loaded into a basket and then pulled up the cliff on the end of a rope, as shown in Fig. 1. The basket of rocks is brought to rest at the top of the cliff.

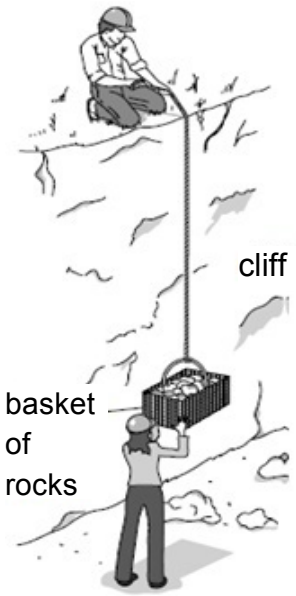


Fig. 1

(a) Which form of energy that the basket possesses is significantly greater at the top of the cliff than when it is at the bottom of the cliff?

..... [1]

(b) The man at the top of the cliff needs energy to pull the basket up. Name the energy that is in the man to pull the basket up.

..... [1]

(c) State the law of conservation of energy.

.....

..... [1]

(d) Is work done by the geologist pulling the rope? Explain.

.....

..... [2]

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2 The following is a list of substances.

copper	sugar	steel
potassium oxide	seawater	hydrogen

Choose from the list above,

(a) a compound containing only two elements, ... [1]

(b) an element made up of molecules, ... [1]

(c) a mixture, ... [1]

(d) a substance that can go through a decomposition reaction.

..... [1]

3 **(a)** Complete the table below.

Compound	Elements present	Chemical formula	Total number of atoms
magnesium hydroxide		$Mg(OH)_2$	
ammonium sulfate		$(NH_4)_2SO_4$	

[4]

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(b) Oxygen is an element. Water is a compound. Air is a mixture.
Use these substances to illustrate the following:

(i) One difference between the composition of an element and the composition of a compound.

.....

.....

..... [1]

(ii) One difference between the composition of a mixture and the composition of a compound.

.....

.....

..... [1]

(iii) One difference between the separation of a mixture and the separation of a compound.

.....

.....

..... [1]

4 A woman wants to buy a new television. She found the following information on the Internet. Use the data in the table to answer the following questions.

Type of television	Power rating in kW
LCD TV	0.17
LED TV	0.10
Plasma TV	0.30
Rear projection TV	0.19

(a) Which television would be the cheapest to use? Explain.

.....

..... [1]

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(b) The woman buys a plasma TV. In one month she watches 25 hours of television. Calculate how much electrical energy was used.

Energy transferred = ... kWh [2]

(c) The woman is charged at $0.30 per kWh of electricity she uses. Calculate the total cost of using the plasma television for one month.

Total cost = $..... [1]

(d) Suggest two reasons why energy labels are put on appliances.

1 .....

.....

2 .....

..... [2]

5 **(a)** State if each of the following is a physical or chemical change.

(i) Rusting of iron nail ……

(ii) Toasting a slice of bread ……

(iii) Boiling a kettle of water ……

(iv) Decay of food …… [2]

(b) Give two reasons to explain your answer for part **(a)(i)**.

.....

..... [2]

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6 Table 6 describes several changes. Complete each row of the table by writing on the dotted line above the arrow a suitable description of the change. The first has been completed for you as an example.

Table 6

example	dry ice —sublimation→ carbon dioxide gas
(a)	acid + alkali —……→ salt + water
(b)	carbon —……→ carbon dioxide formation
(c)	limestone ($CaCO_3$) —……→ calcium oxide (CaO) + carbon dioxide (CO_2)
(d)	water + carbon dioxide —……→ glucose + oxygen + water

[4]

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7 Hydrochloric acid is a strong acid. Sodium hydroxide is a strong alkali.
A student put some dilute sodium hydroxide solution in a beaker with some universal indicator solution.
She added the dilute hydrochloric acid very slowly until the colour of the universal indicator stopped changing.
The table shows the colour of universal indicator at different pH values.

Indicator colour	red	orange	green	blue	purple
pH	0 – 3	3 – 6	7	8 –11	11–14

(a) Describe the colour changes the student saw during the experiment. Start from the time she added the indicator to the sodium hydroxide.

.....

.....

.....

..... [2]

(b) How would the student know when the mixture in the beaker was neutral?

..... [1]

(c) Complete the word equation for the above reaction.

Hydrochloric acid + Sodium hydroxide → …….. + …… [2]

(d) What is the term used to describe the reaction?

..... [1]

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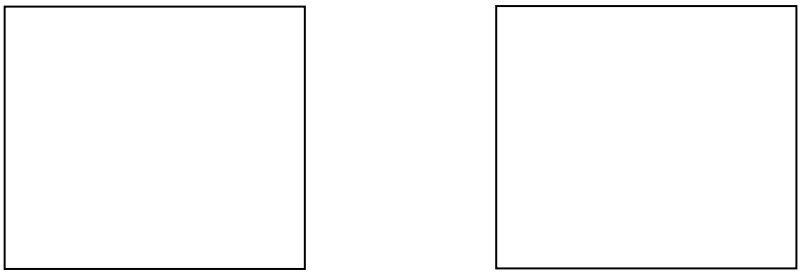
8 The gas in a can of hairspray is made up mainly of a hydrocarbon **X**. The boiling point of the hydrocarbon **X** is -5 ºC and its melting point is -120 ºC.

(a) Complete the table below by making use of the above information.

temperature (ºC)	state of hydrocarbon **X**
30	
-25	liquid
-60	

[1]

(b) If 'O' represents a molecule of hydrocarbon **X**, show the arrangement of the molecules at -25 ºC and at 30 ºC, in the boxes below.



-25 ºC 30 ºC

[2]

(c) Hydrocarbon **X** is usually kept as a liquid in aerosol sprays by pressurizing it. When the seal on the aerosol can is opened, the pressure is reduced. This allows the liquid to turn into a gas.

What is the advantage of carrying hydrocarbon **X** as a liquid rather than a gas?

.....

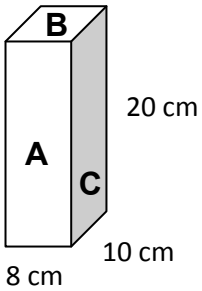
..... [1]

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Section C – Long Structured Questions (30 marks)

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

1 **(a)** Caleb is conducting an experiment on pressure. He places a heavy rectangle brick on mud by standing the brick on face **A.** He then measures the depth of the depression in the mud. He repeats the steps with the other faces, **B** and **C**.



(i) On which face does the brick exert the greatest pressure on the mud?

..... [1]

(ii) The brick presses least deeply into the mud when it stands on one of its faces. Predict the face that the brick stands on when this happens. Explain your prediction.

……

……

..... [2]

(iii) If the brick weighs 40N, calculate the greatest pressure exerted by the brick on the mud.

Pressure = ……N/cm^2 [2]

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(b) (i) State with reasons whether solids **P**, **Q** and **R** are elements, compound or mixture.

Solid	Information
P	**P** is a white solid. It is formed by burning magnesium in oxygen gas.
Q	**Q** is attracted to a magnet. It cannot decompose into anything simpler.
R	**R** contains green and white powder. The green powder dissolves in water but the white powder does not.

……

……

……

……

..... [3]

(ii) State which of the solids in **(b)(i)** can be physically separated and what technique can be used to separate it.

……

……

..... [2]

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2 **(a)** Alfred has two liquids of different substances, **R** and **S**.

Alfred poured two quantities of liquid **R**, each measuring 40 cm^3, into a measuring cylinder. The total volume of the mixture was found to be 80 cm^3. Alfred then poured 40 cm^3 of liquid **R** and 40 cm^3 of liquid **S** into another measuring cylinder. The total volume of the mixture of liquid **R** and **S** was also measured.

What do you think is the total volume of Alfred's mixture? Using your knowledge of particulate model of matter, explain your answer. You should use a relevant diagram to help you in your explanation.

……..

……..

……..

……..

……..

……

..... [5]

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(b) Using the particulate nature of matter, explain why sound travels slower in liquids than in solids.

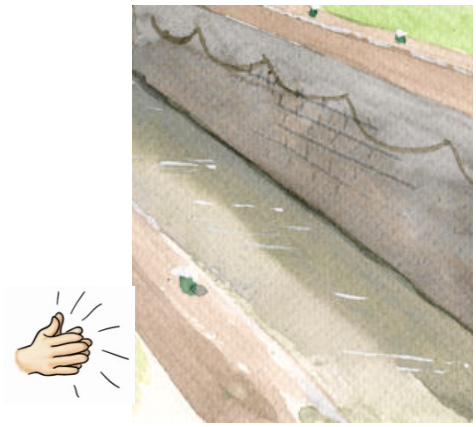
……

……

……

..... [2]

(c) James stands on the bank of a river. He sees a wall on the opposite bank of the river. He gives a single clap. Using a stopwatch he measures the time taken for him to hear the echo from the clap.



(i) What is James trying to find out?

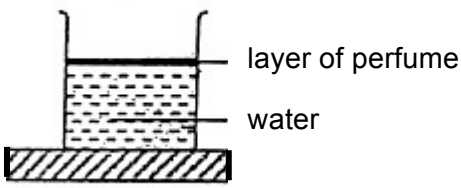
..... [1]

(ii) The echo is heard 4 seconds later. Calculate the distance between James and the wall. (Take the speed of sound in air as 330 m/s on that particular day)

[2]

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3 **(a)** Alice had some perfume which was immiscible (do not mix) with water. She poured some of the perfume into a beaker filled with hot water and left it in the laboratory.
As the perfume was less dense than water, it floated on the surface of the water as shown in the diagram below.



(i) Explain why the smell of the perfume becomes stronger when it is added to the beaker filled with hot water.

……

……

..... [2]

(ii) Using your answer from **(a)(i)**, explain why when Alice uses perfume, she sprays it on her wrist or behind her ears.

……

..... [2]

(b) When the cover of a pot of hot soup is lifted off the pot, it takes some time before droplets of water form on the underside of the cover.
In contrast, droplets of water form, almost immediately, on the cover of a pot taken from the refrigerator.



Explain the above observations.

……

……

……

..... [3]

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(c) A pair of cotton kitchen gloves is used to carry hot pots and pans.



Explain why cotton kitchen gloves are used when carrying hot objects.

……

……

..... [3]

– END OF PAPER –

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The Periodic Table of Elements

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	99 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	185 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 Preseodymium 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.

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Sec 2E EOY 2014
Mark Scheme

Section A [30M]

1	2	3	4	5	6	7	8	9	10
B	A	C	B	C	A	D	A	A	C
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
B	C	D	D	B	B	C	B	D	C
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
B	D	B	B	A	D	D	D	B	B

Section B [40M]

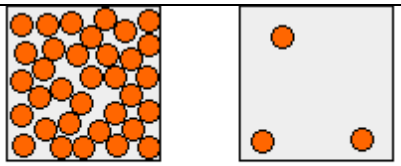
<table>
<tr><th>Qxn</th><th>Answer</th><th>Marks</th></tr>
<tr><td>1(a)</td><td>Gravitational potential energy</td><td>1</td></tr>
<tr><td>(b)</td><td>Chemical potential energy</td><td>1</td></tr>
<tr><td>(c)</td><td>Energy cannot be lost or created, it can only be transferred from one form to another</td><td>1</td></tr>
<tr><td>(d)</td><td>Yes
Force is applied and object moved</td><td>1
1</td></tr>
<tr><td>2(a)
(b)
(c)
(d)</td><td>potassium oxide
hydrogen
seawater / steel
sugar</td><td>1
1
1
1</td></tr>
<tr><td>3(a)</td><td>
<table>
<tr><th>Compound</th><th>Elements present</th><th>Chemical formula</th><th>Total number of atoms</th></tr>
<tr><td>magnesium hydroxide</td><td>magnesium, hydrogen, oxygen [1]</td><td>$Mg(OH)_2$</td><td>5 [1]</td></tr>
<tr><td>ammonium sulfate</td><td>nitrogen, hydrogen, sulfur, oxygen [1]</td><td>$(NH_4)_2SO_4$</td><td>15 [1]</td></tr>
</table>
</td><td>4</td></tr>
<tr><td>(b)(i)

(ii)</td><td>Oxygen contains only one type of atom(s) whereas water contains two types of atoms.

Air contains different substances (elements and compounds) with no fixed mass of percentage whereas water contains hydrogen and oxygen with fixed mass by percentage.</td><td>1

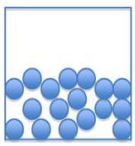
1</td></tr>
</table>

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(iii)	Air can be separated into its components by physical means/methods whereas water can only be separated into its constituent elements by chemical means.	1
4(a)	LED It has the lowest power rating, least energy consumed per second	1
(b)	0.30 x 25 = 7.5 kWh	1 1
(c)	7.5 x 0.30 = $2.25	1
(d)	• so people can compare energy efficiency of different machines • so people can choose the cheapest to run • to encourage people to save energy *Any two*	2
5(a)(i) **(ii)** **(iii)** **(iv)**	Chemical Chemical Physical Chemical *Any 2 correct 1 mark*	2
(b)	Rusting is a chemical change as rust is a new substance formed, different in properties from iron, And the reaction is irreversible	1 1
6(a) **(b)** **(c)** **(d)**	Neutralisation Combustion/oxidation Decomposition Photosynthesis	1 1 1 1
7(a)	starts purple and ends as red goes through blue–green–orange	1 1
(b)	The mixture would go green	1
(c) **(d)**	Sodium chloride + water neutralisation	1, 1 1
8(a)	30 °C - Gas -60 °C - Liquid *2 correct 1 mark*	1
(b)	 -25 °C 30 °C	2
(c)	As a liquid, more X can be stored in a given space than as a gas	1

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Section C [30M]

Qxn	Answer	Marks
1a(i)	B	1
(ii)	C The same force acts on the largest area, hence the pressure exerted least on face C	1 1
(iii)	Pressure = F / area = 40N / 8 x 10 cm^2 = 0.5 N / cm^2	1 1
1b(i)	**P -** compound, it is made up of magnesium and oxygen. **Q** - element, does not decompose into anything simpler. **R -** mixture, the two particles retain their physical properties (colour, solubility) *Accept answer only with suitable reason. Don't accept quoting information wholesale as reason except for **Q**.*	1 1 1
(ii)	Solid **R**. Filtration.	1 1
2a	 Two liquid particlesof different sizes [1] Smaller particles fill up the empty spaces of the larger particles [1] **R and S** The total volume should be **less than 80cm^3**. Liquid **R** and liquid S are **made up of particles of different sizes**. These particles have empty spaces in between them. On mixing, **smaller particles <u>filled up the spaces in between the larger particles</u>**. Therefore, volume of the mixture is less than the separate volumes added together.	2 1 1 1
2b	Molecules of solids are packed closely together while molecules of liquid are packed less closer together, hence the distance between the molecules of solids is smaller than liquids As a result transfer of sound energy is faster in solids than in liquids	1 1
2c(i)	Width of the river / his distance from the wall / time taken for sound to travel from him to the wall and back to him	1

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2c(ii)	Speed = 2D / time taken 2D = speed x time = 320m/s x 4s = 1280 D = 640m	1 (formula) 1 (answer)
3(a)(i) **(ii)**	Perfume particles absorb heat energy from the hot water so more perfume evaporate into the air There are blood vessels close to the skin on the wrist and behind the ears. These warm up the perfume and makes it evaporate faster into the air	1 1 1 1
(b)	The cover of the pot of hot soup is hot, so it needs to cool down before there is condensation of water vapour The cover of the pot from the fridge is cold so water vapour from the air condenses immediately on it.	1 1 1
(c)	Cotton kitchen gloves consist of <u>air pockets</u> which are <u>good insulators</u>. It prevents us from getting burned.	1, 1 1

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