Name:	Register Class	Number

DUNEARN SECONDARY SCHOOL
MID-YEAR EXAMINATION 2017
LOWER SECONDARY SCIENCE
Secondary Two Express

28th April 2017 (Friday) **08 00 – 10 00 2 hours**

INSTRUCTIONS TO CANDIDATES

Answer **ALL** the questions in Section A.
For each of the question, there are 4 possible answers, **A, B, C** and **D**.
Choose the **one** you consider correct and shadethe answers in the OTAS sheet provided.
If needed, take g = 10 N/kg.
Answer **ALL** questions in Section B and C by writing in the spaces provided.
The number of marks is given in brackets [ ] at the end of the question or part question.
Candidates are reminded that **all** quantitative answers should include appropriate units and rounded off to appropriate significant figures or decimal places.
Candidates are advised to show all their workings in a clear and orderly manner.

Section B						Section C		
Q1	Q2	Q3	Q4	Q5		Q6	Q7	Q8

Section	Marks
A	/30
B	/40
C	/30
Penalties	
Overall Marks	/100

Parent's Signature:

____

Setter: Mdm. Nor'aliah

This question paper consists of **22**printed pages (including this cover page)

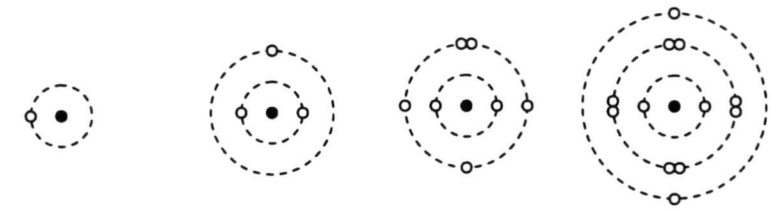
Section A [30 marks]

Answer **all** questions in this section in the OTAS provided.

1 Which of the following statements is always true about atoms of different elements?

A They have different number of protons.
B They have different number of neutrons.
C They have the same number of protons.
D They have the same number of neutrons.

2 The diagram shows the electronic structures of four elements.



element 1 element 2 element 3 element 4

Which two elements are metals?

A 1 and 2
B 1 and 3
C 2 and 4
D 3 and 4

3 Which of the following has the same number of electrons as an oxide ion, O^{2-}?

A Ca^{2+}
B K^{+}
C N^{3-}
D S^{2-}

4 Which element in the table below has 24 electrons in its atom?

	atomic number	nucleon number
A	12	24
B	21	45
C	24	52
D	26	56

5 The nucleon number and proton number of an atom of X and an atom of Y are shown.

	X	Y
Nucleon number	39	40
Proton number	19	18

Which statement about X and Y is correct?

A An atom of X has fewer electrons than an atom of Y.
B An atom of X has fewer neutrons than an atom of Y.
C X is above Y in the same group of the Periodic Table.
D X is in the same period in the Periodic Table as Y.

6 How are the elements arranged in the Periodic Table?

A in order of atomic mass
B in order of chemical reactivity
C in order of electron shells
D in order of proton number

7 An element X has two isotopes, ^{238}X and ^{235}X.

How does ^{238}X differ from ^{235}X?

A It has three more protons and 3 more electrons.
B It has three more protons.
C It has three more neutrons and three more electrons.
D It has three more neutrons.

8 Which atom does **not** contain any neutrons?

A argon atom
B carbon atom
C helium atom
D hydrogen atom

9 The table shows the soil pH values for growing different crops.

Which crop grows **best** in an almost neutral soil?

	crop	pH
A	apple	5.5 – 6.5
B	carrot	6.8 – 7.2
C	oats	4.5 – 6.5
D	plum	7.5 – 8.5

10 When a blue litmus paper is placed in solution X, it remains blue. Which of the following **cannot** be solution X?

A alcohol
B ethanoic acid
C sodium hydroxide
D water

11 What is the name given for the chemical reaction between potassium hydroxide solution and dilute hydrochloric acid?

A combustion
B decomposition
C neutralisation
D separation

12 Which of the following is **incorrect** about alkalis?

A They can conduct electricity.
B They give red colour when Universal Indicator is added to it.
C They have a soapy feeling and a bitter taste.
D They are substances which can be found in detergents.

13 Which substance does **not** react with any dilute acids?

A aluminium
B copper
C magnesium
D sodium

14 Which of the following does **not** react with dilute hydrochloric acid?

A calcium
B calcium carbonate
C calcium hydroxide
D calcium nitrate

15 The table shows some information about the colour changes of three indicators.

Indicator	Colour change	pH at which colour change occurs
Phenolphthalein	Colourless to pink	10.0
Bromothymol blue	Yellow to blue	6.5
Thymol blue	Red to yellow	3.0

What colour would be observed if all three indicators were mixed together at pH 6?

A blue
B green
C orange
D yellow

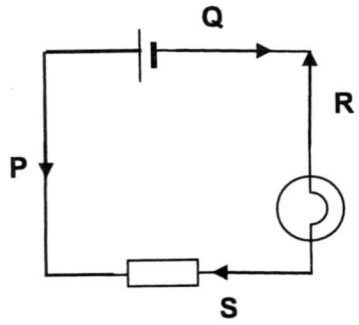
16 Which substance can reduce the acidity of soils?

A ammonium sulfate
B calcium hydroxide
C calcium nitrate
D sodium chloride

17 Which of the following best explains an electric current?

A An electric current is the flow of atoms in a circuit per second.
B An electric current is the flow of electrons in a circuit per second.
C An electric current is the flow of neutrons in a circuit per second.
D An electric current is the flow of positive charges in a circuit per second.

18 An electric circuit is shown.



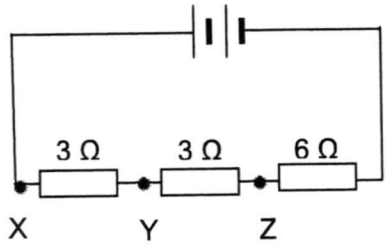
Which arrows show the direction of the convectional current and the direction of the electron flow?

	Direction of the convectional current	Direction of the electron flow
A	P	Q
B	Q	S
C	R	P
D	S	R

19 Which of the following is the SI unit for electric current?

A ampere
B ohm
C volt
D watt

20 An electrical circuit is connected as shown in the diagram.



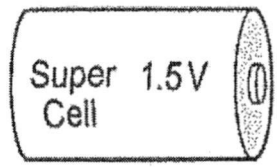
Where in the circuit does the current have the greatest value?

A at X
B at Y
C at Z
D The current is the same at all three points.

21 A metal key is to be coated with copper. Both the metal key and copper are immersed in a solution. Which of the following procedures is correct?

A Both copper and the metal key are placed at the positive terminal of the battery.
B Both copper and the metal key are placed at the negative terminal of the battery.
C Copper is placed at the positive terminal and the metal key is placed at the negative terminal of the battery.
D Copper is placed at the negative terminal and the metal key is placed at the positive terminal of the battery.

22 A super cell has '1.5V' marked on it.



What does this mean?

A The current the cell can supply is 1.5V.
B The e.m.f of the cell is 1.5V.
C The energy stored in the cell is 1.5V.
D The power the cell can supply is 1.5V.

23 Which of the following terms is used to describe a mains socket with too many appliances connected in parallel?

A Overconnecting
B Overheating
C Overloading
D Overpower

24 An electric power tool is being used outdoors in a shower of rain.

What is the **greatest** hazard to the user?

A The cable gets hot and causes burns.
B The circuit breaker cuts off the current.
C The current passes through water and causes a shock.
D The water dissolves the plastic covering of the wire.

25 A cyclist travels at a speed of 8.0 km/h. What distance would he have travelled in 45 mins?

A 2.0 km
B 5.6 km
C 6.0 km
D 360 km

26 Three different types of forces are given below.

I	Frictional force
II	Gravitational force
III	Magnetic force

Which of the forces are classified as non-contact forces?

A I, II
B I, III
C II, III
D I, II, III

27 Which of the following statements is **incorrect** about forces?

A A 100g object exerts a greater force than 50g object on your hand.
B Changing the shape of a plasticine model is the effect of a force.
C Forces always act in the horizontal direction only.
D Forces are measured in the unit newton.

28 Which of the following is **not** a method to conserve energy?

A Build more factories.
B Install solar panel on the rooftop to capture the solar energy for use in the household.
C Minimise the use of private vehicles on the road by using public transport.
D Turn off electrical appliances when not in use.

29 Which of the following statements are **incorrect** about solar cells?

I	Solar cells cannot work under artificial light.
II	Solar cells can only be used in small portable equipment such as a calculator.
III	Solar cells can convert the solar energy into electrical energy.

A I, II
B I, III
C II, III
D I, II, III

30 Which of the following statements are **incorrect**?

I	One of the sources for kinetic energy is wind.
II	Only the sun has the effect of the gravitational pull on tides.
III	The water in the hydroelectric dam possesses chemical potential energy.

A I, II
B I, III
C II, III
D I, II, III

Section B [40 marks]

Answer **all** questions in this section in the space provided.

1 Fig. 1.1 below shows the structure of an atom of the element **Z**.

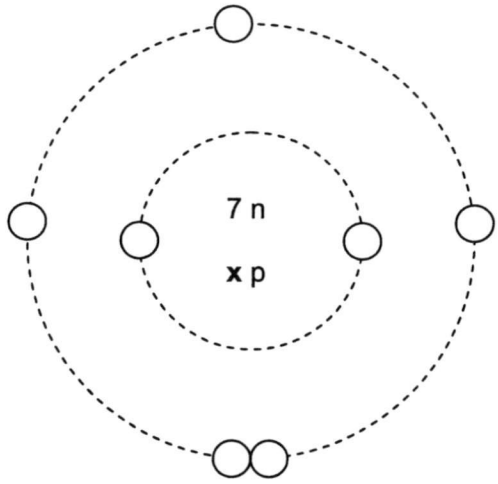


Fig. 1.1

(a) State the value of **x**. ..... [1]

(b) Write down the electronic configuration of element **Z**.

..... [1]

(c) Not all of the atoms of element **Z**are identical. All the atoms of element **Z** have the same chemical properties but can have different masses.

Explain why different atoms of element **Z**can have different masses but the same chemical properties.

.....

.....

..... [2]

2 Information for six atoms, **A** to **F** is shown in Table 2.1. Use the information to answer

Table 2.1

the following questions.

Atom	Proton number	Nucleon number	Number of electrons
A	3	7	3
B	6	12	6
C	12	24	12
D	12	26	12
E	18	40	18
F	19	39	19

(a) Which atoms are in the same group in the Periodic Table?

..... [1]

(b) Which atom(s) belong(s) to period 2?

..... [1]

(c) Which atoms belong(s) to the group called Noble Gas? Explain your answer.

.....

.....

..... [2]

(d) Which atom is the lightest?

..... [1]

3 **(a)** Fig. 3.1 shows a ball being pushed on a floor. It moves a distance before coming to a stop.

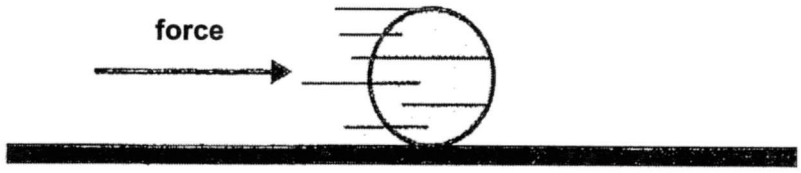


Fig. 3.1

(i) Explain why the ball comes to a stop after a while.

..... [1]

(ii) On the diagram, draw and label another type of force that acts on the ball. [2]

(iii) State a way to make the ball move for a longer period of time.

.....

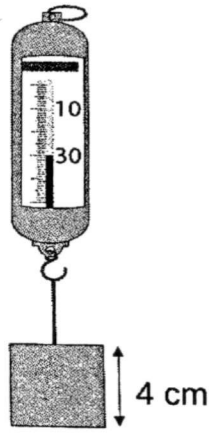
.....

..... [1]

(b) An experiment is carried out by a student. Fig 3.2a shows a measuring instrument with no cube attached to it. Fig. 3.2b shows a cube of sides 4cm that is attached to the measuring instrument as shown.

the reading when it has no load

Fig. 3.2a



the reading when a cube is attached to it

Fig. 3.2b

(i) Name the measuring instrument used.

..... [1]

(ii) Using Fig. 3.2a and Fig. 3.2b, calculate the weight of the cube.

weight = ... [1]

(iii) Calculate the pressure, in N/cm^2, exerted by the cube when it is placed on a table.

pressure = ... [3]

(iv) Calculate the mass of the cube.

mass = ... [2]

4 **(a)** In the box provided, draw an electric circuit that consists of

1. three cells connected in series,
2. two bulbs connected in parallel,
3. a switch which turns off both bulbs at once,
4. an ammeter to measure the current through any one bulb,
5. a variable resistor to vary the total current in the circuit.

[5]

(b) Fig. 4.1 below shows part of a circuit.

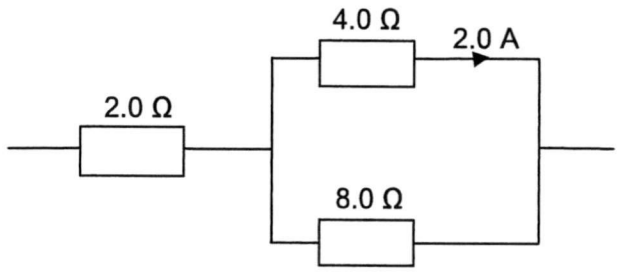


Fig. 4.1

(i) Calculate the potential difference across the 4.0 Ω resistor.

potential difference = ... [2]

(ii) Hence, state the potential difference across the 8.0 Ω resistor.

use only

potential difference = ... [1]

(iii) Calculate the total resistance of the circuit above.

total resistance = ... [2]

5 **(a)**A boy pushes a trolley with a force of 50N. It moves through a distance of 2m.

(i) What is the work done by the boy on the trolley?

work done = ... [2]

(ii) Describe the energy conversion involved in the above example.

.....

.....

..... [2]

(iii) Explain why **no** work is done when the same boy pushes against a wall.

..... [1]

(b) Fig. 5.1 shows a pendulum swinging.

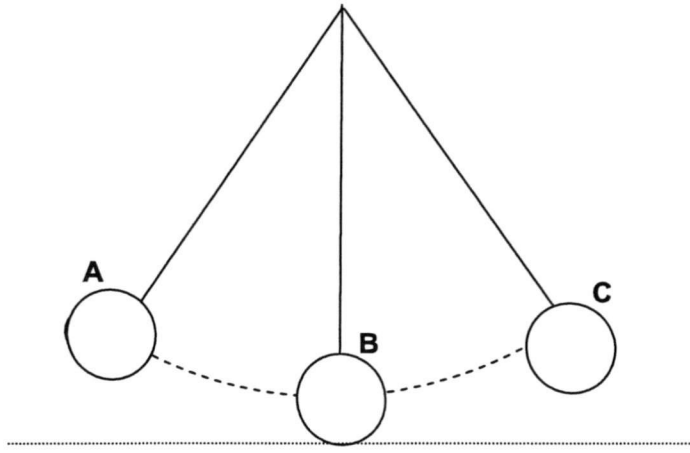


Fig. 5.1

(i) State the Principle of Conservation of Energy.

.....

.....

..... [2]

(ii) Describe the energy conversion as the pendulum ball moves from **A** to **B**.

.....

..... [1]

(iii) If the total energy of the pendulum ball at point **A** is 100 J, what will be the total energy at point **B**? State the assumption made.

.....

..... [2]

Section C [30 marks]

use only

*Answer **all** questions in this section in the space provided.*

6 Fig. 6.1 and Fig. 6.2 shows atoms of two elements **Y** and **Z** respectively.

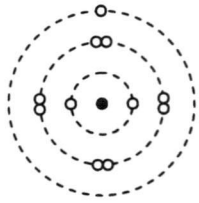


Fig. 6.1

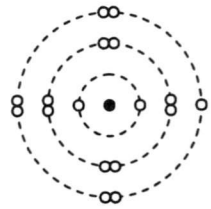


Fig. 6.2

(a) Using the Periodic Table, identify the chemical name for elements **Y** and **Z**.

Y ..... [1]

Z ..... [1]

(b) Describe how the ion of element **Z** is formed from the atom.

.....

..... [1]

(c) Draw the electronic structures of the ions of elements **Y** and **Z** respectively. [4]

Ion of element **Y** Ion of element **Z**

(d) Write down the chemical name of the ion of element **Y** and **Z** respectively.

Ion of element **Y**: ..... [1]

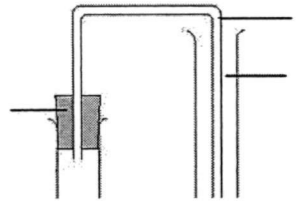
Ion of element **Z**: ..... [1]

(e) Explain why the ion of element **Y** is **not** electrically neutral.

.....

..... [1]

7 Fig. 7.1 shows a reaction between dilute nitric acid and zinc carbonate. At the end of the reaction, the pH value of the solution is 7.



c

—

Fig. 7.1

(a) State the chemical name of limewater.

..... [1]

(b) Describe two observations that can be made.

.....

.....

.....

..... [2]

(c) Write a word equation for this reaction.

..... [2]

(d) What observation in this experiment would enable you to know that the reaction has stopped?

..... [1]

(e) If the reaction was carried out with zinc metal instead,

(i) which part of the set-up must be changed?

.....

..... [1]

(ii) name the gas that is produced and describe the test for this gas.

..... [3]

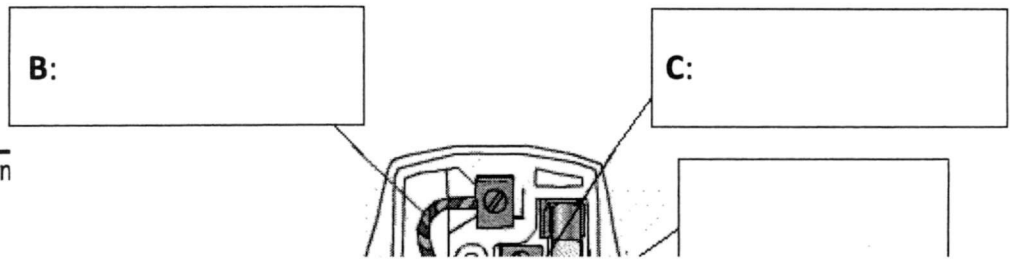
.....

.....

.....

.....

8 Fig. 8.1 shows the structure of a three-pin plug.



D:

Fig. 8.1

(a) Label the parts **A**, **B**, **C** and **D** respectively in the boxes provided. [3]

(b) Describe the function of part **B**.

.....

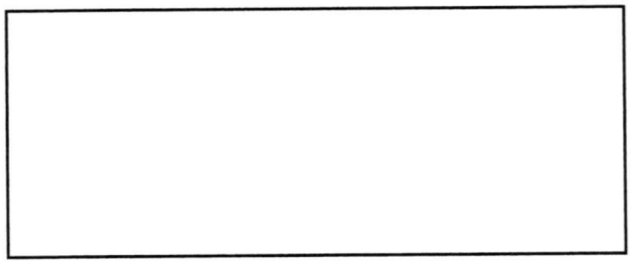
..... [2]

(c) If part **B** is to be removed, will the appliance still be able to work normally? Explain your answer.

.....

..... [1]

(d) Draw the electrical symbol for part **D** in the box below.



[1]

(e) The cost of using a unit (kWh) of electricity is 27 cents. Table 8.2 shows the daily usage of certain home appliances.

Table 8.2

Appliance	Power rating	Time used
Water heater	800 W	45 min
Television	1.5 kW	4 hours

Calculate the total cost of electrical energy usage at the end of the month. (Assume that there are 30 days in a month.)

total cost = ... [3]

End of Paper

Examiner's use only

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The Periodic Table of Elements

Group																	
I	II											III	IV	V	VI	VII	0
							1 H hydrogen 1										2 He helium 4
3 Li lithium 7	4 Be beryllium 9		Key proton (atomic) number atomic symbol name relative atomic mass									5 B boron 11	6 C carbon 12	7 N nitrogen 14	8 O oxygen 16	9 F fluorine 19	10 Ne neon 20
11 Na sodium 23	12 Mg magnesium 24											13 Al aluminium 27	14 Si silicon 28	15 P phosphorus 31	16 S sulfur 32	17 Cl chlorine 35.5	18 Ar argon 40
19 K potassium 39	20 Ca calcium 40	21 Sc scandium 45	22 Ti titanium 48	23 V vanadium 51	24 Cr chromium 52	25 Mn manganese 55	26 Fe iron 56	27 Co cobalt 59	28 Ni nickel 59	29 Cu copper 64	30 Zn zinc 65	31 Ga gallium 70	32 Ge germanium 73	33 As arsenic 75	34 Se selenium 79	35 Br bromine 80	36 Kr krypton 84
37 Rb rubidium 85	38 Sr strontium 88	39 Y yttrium 89	40 Zr zirconium 91	41 Nb niobium 93	42 Mo molybdenum 96	43 Tc technetium -	44 Ru ruthenium 101	45 Rh rhodium 103	46 Pd palladium 106	47 Ag silver 108	48 Cd cadmium 112	49 In indium 115	50 Sn tin 119	51 Sb antimony 122	52 Te tellurium 128	53 I iodine 127	54 Xe xenon 131
55 Cs caesium 133	56 Ba barium 137	57 – 71 lanthanoids	72 Hf hafnium 178	73 Ta tantalum 181	74 W tungsten 184	75 Re rhenium 186	76 Os osmium 190	77 Ir iridium 192	78 Pt platinum 195	79 Au gold 197	80 Hg mercury 201	81 Tl thallium 204	82 Pb lead 207	83 Bi bismuth 209	84 Po polonium –	85 At astatine –	86 Rn radon –
87 Fr francium –	88 Ra radium –	89 – 103 actinoids	104 Rf Rutherfordium –	105 Db dubnium –	106 Sg seaborgium –	107 Bh bohrium –	108 Hs hassium –	109 Mt meitnerium –	110 Ds darmstadtium –	111 Rg roentgenium –	112 Cn copernicium –		114 Fl flerovium –		116 Lv livermorium –		

lanthanoids	57 La lanthanum 139	58 Ce cerium 140	59 Pr praseodymium 141	60 Nd neodymium 144	61 Pm promethium –	62 Sm samarium 150	63 Eu europium 152	64 Gd gadolinium 157	65 Tb terbium 159	66 Dy dysprosium 163	67 Ho holmium 165	68 Er erbium 167	69 Tm thulium 169	70 Yb ytterbium 173	71 Lu lutetium 175
actinoids	89 Ac actinium –	90 Th thorium 232	91 Pa protactinium 231	92 U uranium 238	93 Np neptunium –	94 Pu plutonium –	95 Am americium –	96 Cm curium –	97 Bk berkelium –	98 Cf californium –	99 Es einsteinium –	100 Fm fermium –	101 Md mendelevium –	102 No nobelium –	103 Lr lawrencium –

The volume of one mole of any gas is 24 dm^3 at room temperature and pressure (r.t.p.).

Dunearn Secondary School
General Science
Secondary 2 Express
Mid-Year Examination 2017
Answer Scheme

Marking Schedule

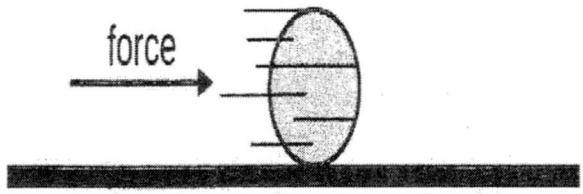
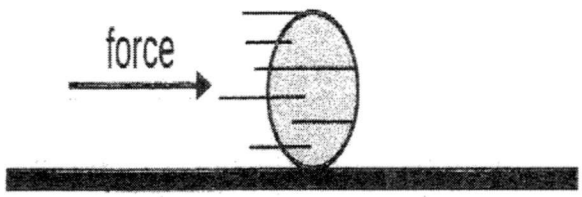
	Date of exam	Passing of the scripts will take place in the mornings. The dates are tentatively set.	
Markers	**28 Oct (Fri)**	**2 May (Tue)**	**4 May (Thur)**
Shi Qian All MCQ (30marks) B1 –B2 (9 marks) C6 (10 marks)		All MCQs from 2 OP and 2 SP	
Aliah B3-B5 (31 marks)	2 Opal 2 Sapphire		
Yvonne C7-C8 (20 marks)			2 Opal 2 Sapphire

Section A (30 marks)

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

Section B (40 marks)

[Deduct 1 answer mark if units are not stated or wrongly stated, maximum of 2 marks to be deducted from whole paper.]

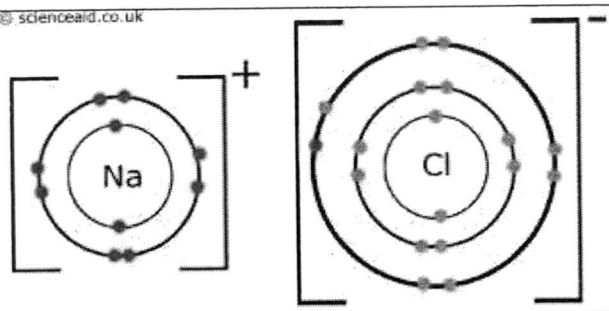
Qns	Answer	Remarks
1 a	7	1
b	2.5	1
c	They have the same number of electrons/protons But different number of neutrons hence different masses.	1 1
	Total	4
Marker's comments		
2a	A and F	1
2b	A and B	1
2c	E; It has a completely filled valence shell.	1 1
2d	A	1
	Total	5
Marker's comments		
3ai	Frictional force acts on the ball.	1
aii	 **OR** 	1 mark for correct direction of arrow. 1 mark for correct label.
aiii	Add a layer of oil/water on the surface of the floor./ Grease the ball. (increase the force applied is also accepted.)	1
bi	Forcemeter/ spring balance	1
ii	20N	1
iii	Area of cube = 4 X 4= 16 cm^2 Pressure= Force/Area = 20/16 = 1.25N/cm^2	1 1 (allow e.c.f) 1 (allow e.c.f)
iv	W=mg 20=m X 10	1 (allow e.c.f)

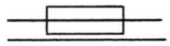
	M = 2 kg	1 (allow e.c.f)
	Total	11
Marker's comments	3ai. Mark is not given if friction/air resistance is not stated in the answer. Quite a number of students just state that kinetic energy is being converted to heat and sound energy without stating due to friction/air resistance. aii. Students did not draw the correct direction for friction and/or did not draw at the correct position (between the ball and table) For weight, students did not draw on the ball and from the c.g of the ball. aiii. Question is well done. Quite a number of students state 'increase the force applied' as a possible way. Students to recall the ways to reduce friction. bi. Some students label it as compression spring balance/electronic spring balance/beam balance. bii. Students not able to determine the weight of the cube. Some of the students are not able to state the unit for weight. biii. Some students not able to calculate area of the cube. Some answers are left as fractions or not in 3 significant figures. biv. Quite a number of students are not able to calculate mass from the weight given and SI unit incorrectly given for the calculation is g.	
4a		Three cells connected in series -1 Two bulbs in parallel -1 A switch on the live wire -1 An ammeter in series with one of the bulb -1 Correct symbol and position of variable resistor -1
4bi	V=IR = 4 x 2 = 8.0 V	1 1
ii	8.0 V	1
iii	$1/R = 1/R_1 + 1/R_2$ 1/R = 1/4 + 1/8 R= 8/3 =2.667Ω Total resistance = 2.667 + 2 = 4.67 Ω	 1 (final answer) 1 (final answer)
	Total	10
Marker's comments	4a. Some students are not able to draw the symbol for the variable resistor. Some students are unable to draw the proper position for the ammeter. 4bi. Question is badly attempted. Students could not calculate the potential difference using V=IR bii. Students are not able to recall that for parallel arrangement the potential difference remains constant value.	

	biii. Students are not able to calculate the total resistance for the parallel arrangement properly. Working not done properly and some of the students' answers are not in 3 significant figures but is left as a fraction.	
5ai	Work done = 50 x 2 = 100 J	1 1
ii	Chemical potential energy ❼ kinetic energy ❼ heat and sound energy	2 (all 3 correct -2 marks 2 correct -1 mark 0-1 correct – 0 mark)
iii	The wall did not move.	1
bi	Energy cannot be created nor destroyed. It only be converted from one form to another.; Total amount of energy remains the same.;	1 1
bii	gravitational potential energy ❼kinetic energy	1
biii	100J.; No energy lost to the surroundings in the form of heat or sound.;	1 1
	Total	10
Marker's comments	5ai. Quite a number of students are not able to state the unit for work done as joules. aii. Most students did not give the last part of the energy conversion (kinetic energy ❼ heat and sound energy) aiii. Marks not awarded for vague answers like there is no movement and quite a number of the students wrote down 'trolley did not move' when question is asking about a wall. bi. Quite a number of students did not state 'total amount of energy remains constant'. bii. Some students wrote down kinetic potential energy as answers. biii. Most students are able to state the energy remains the same. However they did not state no energy lost to the surroundings as the reason but just total amount of energy of the system remains constant.	

Section C (30 marks)

Qns	Answer	Remarks
6a	Y: sodium Z: chlorine	1 1
b	The atom gains 1 electron to form an ion.	1
c	1 mark for correct charge on each ion; 1 mark for correct number of electrons on each ion (for chloride ion, there must be one electron that is using a dot/cross);	4 (Allow X and Y to be used as labels. Accept all for sodium ion.)

		
d	X: sodium ion Y: chloride ion (accept without ion)	1 1
e	It has more protons than electrons.	1
	Total	10
Marker's comments		
7a	Calcium hydroxide	1
b	Effervescence can be seen.; White precipitate forms in limewater.	1 1
c	Zinc carbonate + dilute nitric acid ❼ zinc nitrate + carbon dioxide + water	2 (2 marks for both correct reactants and products, 1 mark for correct reactants/products, 0 mark for any mistake in both reactants and products)
d	No more effervescence seen in limewater.	1
ei	Remove the test tube containing limewater/ Remove the delivery tube	1
ii	Hydrogen; Place a lighted splint near the gas; It will extinguish with a 'pop' sound.;	1 1 1
	Total	10
Marker's comments	7a. Many students could not recall the chemical name of lime water. 7b. As long as bubbling or effervescence is written, mark is given even though some students mentioned effervescence in the limewater (only). A small handful of student still wrote "chalky". Some students wrote "white precipitate formed" but did not mention where and no mark was given. 7c. Some students gave the general formula of metal carbonate + acid and gave "salt" as the product, while some students did not know what a word eqaution was. A few students used "=" instead of arrow and this was not penalized for more lenient marking, however, they should be reminded that it is an arrow sign. 7d. No more zinc carbonate left was often seen as the answer. 7ei. The keyword "remove" must be written or "changed to lighted	

	splinter" must be written. No marks given if students just write what needs to be changed, as it may mean changing to a new set of the same thing. 7eii. Some students misread the question and talked about carbon dioxide gas. Some students did not know how to describe "lighted splint" and used words e.g. wooden stick, or the word "lighted" was missing. These were not awarded marks.The keyword "extinguish" should also be seen.	
8a	A: neutral wire B: earth wire C: live wire D: fuse	4 correct – 3 marks 3 correct – 2 mark 2 correct – 1 mark 0-1 – 0 mark
b	It is connected to the metal casing of the appliance.; So that user will not get electrocuted when appliance becomes faulty by sending excessive current directly to the Earth.;	1 1
C	Yes. The circuit is still a closed circuit.	1 (both must be correct)
d		1
e	Energy used by water heater = 0.8 x 0.75 = 0.6kWh Energy used by television = 1.5 x 4 = 6kWh Total cost = \$0.27 x 6.6 x 30 = \$53.46	1 1 1
	Total	10
Marker's comments	8a. Most students are able to get this question all correct. 8b. Most students missed out the point that the earth wire is connected to the metal casing. Many students used the word "transfer" current to the ground. 8c. Most students are not able to describe that it is still a closed circuit. The best answers that were also accepted mentioned about the live wire and neutral wire still present to send the current to and back to the appliance. 8d. Quite a handful of students did not know the symbol. 8e. Most students could calculate correctly, with a handful of students making the rounding off error. A few students went to total up the hours and the kW first for both applianced together and multiply them together and obtained the incorrect answers.	