Name: ..... ( ) Class: .....

WOODLANDS SECONDARY SCHOOL
WEIGHTED ASSESSMENT 2 2019

Level:	Secondary One Exp	Marks:	45
Subject:	Lower Secondary Science	Day:	Monday
Paper:		Date:	13 May 2019
Duration:	1 hour	Time:	0750-0850

READ THESE INSTRUCTIONS FIRST
Write your index number and name on all the work that you hand in, including the Answer Sheet.
Do not use staples, paper clips, glue or correction fluid.

Section A
Write in soft pencil. There are **ten** 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 the table provided on page 2.

Sections B
Answer **all** questions.

You may use an HB pencil for any diagrams or graphs.
Write in dark blue or black pen.
Write your answers in the spaces provided on the question paper.
You may lose marks if you do not show your working or if you do not use appropriate units.
The number of marks is given in brackets [ ] at the end of each question or part question.

A copy of the Periodic Table is printed on page 16.
The use of an approved scientific calculator is expected, where appropriate.

Section A	Section B	Total
/10	/35	/45

DO NOT TURN THE PAGE UNTIL YOU ARE TOLD TO DO SO.
This document consists of **16** printed pages.

Section A

Write your answer in the table below.

Qn 1	Qn 2	Qn 3	Qn 4	Qn 5
Qn 6	**Qn 7**	**Qn 8**	**Qn 9**	**Qn 10**

1 Which of the following scientific applications benefit us?

A creation of radioactive wastes
B desalination of seawater
C excessive use of plastics
D physical inactivity caused by gaming

2 The following hazard symbol is found on a bottle.

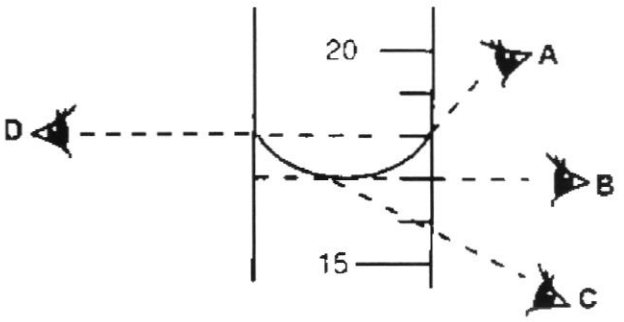
Predict what will happen if we spill some chemical from the bottle on our skin.

A Radiation from the chemical will harm us.
B The chemical emits a fume that irritates our nose.
C The chemical may corrode our skin.
D Traces of flammable chemical makes it dangerous for us to go near flames.

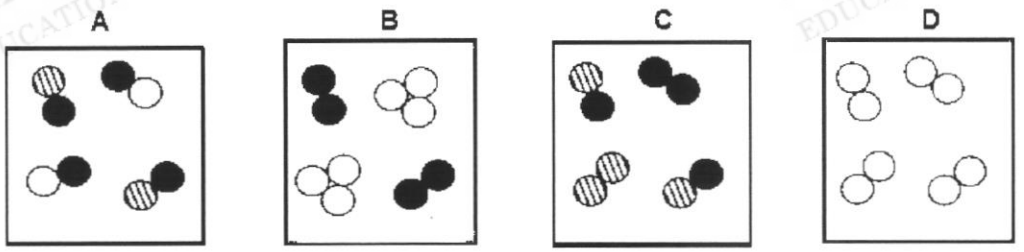
3 Which physical properties does **not** explain why aluminium is used to make the body of aircrafts?

A It can conduct electricity.
B It has low density.
C It has high melting point.
D It is malleable.

4 Where should the eye be positioned when taking a reading from a measuring cylinder?



5 Which diagram shows a mixture of different elements?



6 Calcium nitrate has the formula $Ca(NO_3)_2$.

How many elements are present in calcium nitrate?

A 3

B 4

C 8

D 9

7 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	allows light to pass through	does not allow light to pass through
B	cloudy	clear
C	heterogeneous	homogeneous
D	residue left after filtration	no residue left after filtration

8 Which of the following consists of an element, compound and mixture?

A aluminium, brass, mercury
B brass, chlorine, steel
C brass, sodium chloride, mercury
D mercury, graphite, sodium

9 Which of the following would decrease the rate of dissolving?

A crushing the solutes
B heating the solvent
C stirring the mixture
D use larger size of solute

10 A student makes some crystals.

What should the student check to test the purity of the crystals?

A colour of crystals
B melting point of crystals
C size of crystals
D solubility of crystals

Section B

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

11 Fig. 11 shows a girl heating a boiling tube in the laboratory.

Fig. 11

(a) **Circle** **two** hazards shown in Fig. 11 and explain how these may pose as a danger to the girl.

.....

.....

.....

.....[2]

(b) Name the flame which the girl should use for heating. Give a reason for your answer.

.....

.....[2]

12 State the physical property which makes the following material suitable to making the following:

(a) glass to make window

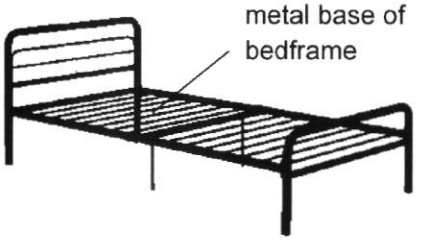
.....

.....[1]

(b) metal to make the base of bedframe

.....

.....[1]



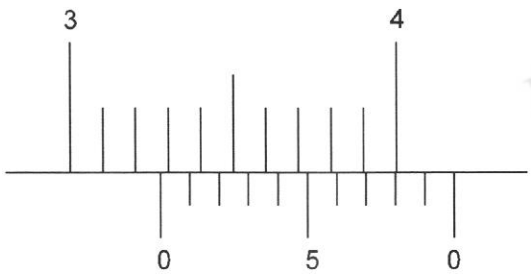
13 Complete the table on apparatus and physical quantities for measurement.

	apparatus	quantity measured	S.I. unit
(a)		temperature	
(b)			kilogram
(c)	digital stopwatch		

[3]

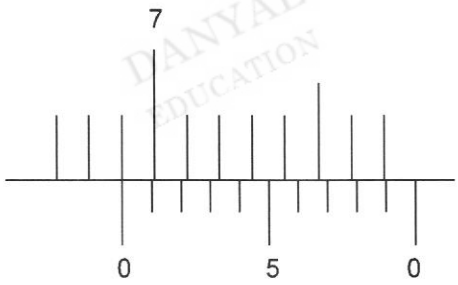
14 Read and record the following measurements on the Vernier calipers.

(a)



reading = ... cm [1]

(b)



reading = ... cm [1]

15 The following are labels that describe the **contents** of four different bottles.

content of bottle **N**	content of bottle **O**
Cannot be made into any simpler substances by chemical methods.	Has a constant composition by mass and cannot be broken down into simpler substances.

content of bottle **P**	content of bottle **Q**
Has a fixed melting point. Contains several different atoms.	Coloured white. Only some parts dissolve in an excess of water.

Classify the contents of each bottle and draw a **circle** around either **element**, or **compound**, or **mixture**.

(a) Substance in bottle **N**: element compound mixture [1]

(b) Substance in bottle **O**: element compound mixture [1]

(c) Substance in bottle **P**: element compound mixture [1]

(d) Substance in bottle **Q**: element compound mixture [1]

16 A sample of water contains salt as an impurity. The apparatus shown in Fig. 16 is used to produce pure water from the sample.

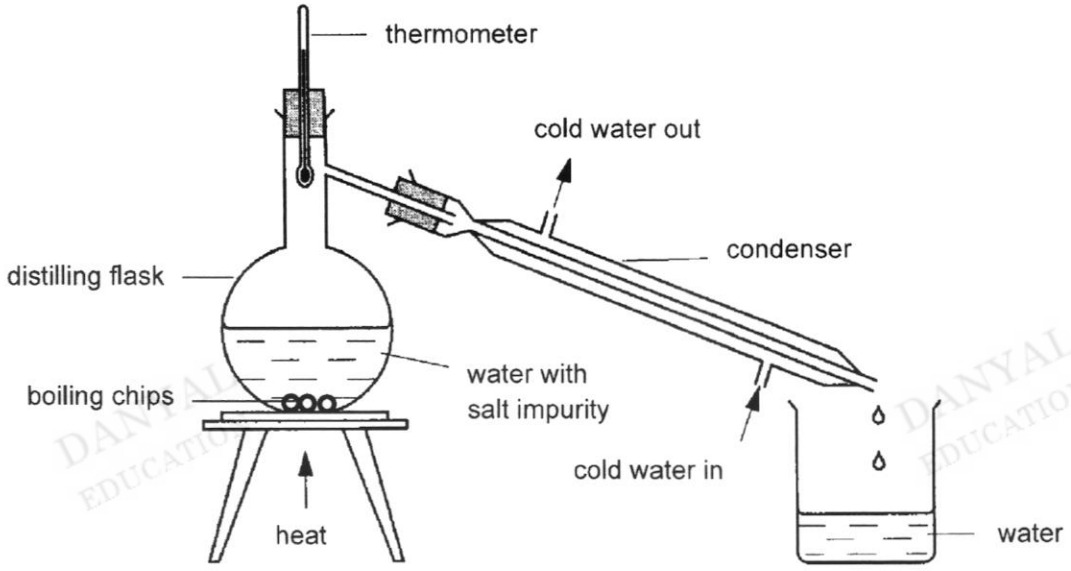


Fig. 16

(a) Describe the function of the boiling chips.

.....[1]

(b) Describe what happens to the water vapour when it enters the condenser.

.....

.....[1]

(c) Predict the temperature reading of the thermometer if the thermometer is lowered into the boiling water with salt impurity.

.....[1]

17 A mixture is made up of substance **X**, **Y** and **Z**. Table 17 shows some properties of these substances.

Table 17

substance	solubility in water	solubility in ethanol	effect of heating
X	insoluble	insoluble	no change
Y	insoluble	soluble	decomposes
Z	soluble	soluble	no change

Describe the steps to obtain a dry sample of **Z** from the mixture containing **X**, **Y** and **Z**.

.....

.....

.....

.....

.....

.....[3]

18 Barry planted some radish seeds in four similar pots. Each pot contains soil with a different pH. The experimental set-up is shown in Fig. 18.1.

After two weeks, Barry measured the height of the radish plant as shown in Fig. 18.2.

Fig. 18.1 **Fig. 18.2**

(a) State a hypothesis for Barry's experiment.

.....

.....[1]

(b) State the dependent and independent variables in this experiment.

dependent variable .....

independent variable ..... [2]

(c) State **two** controlled variables to ensure a fair test.

.....

.....[1]

(d) What conclusion can he make from his experiment?

.....

.....[1]

19 Table 19 shows some physical properties of lithium, sodium, potassium and rubidium.

Table 19

metals	melting point/ °C	density/ g/cm^3
lithium	180	0.53
sodium	98	0.97
potassium	63	0.86
rubidium	39	1.53

(a) **(i)** Which group does lithium, sodium, potassium and rubidium belong to in the Periodic Table?

group ..... [1]

(ii) Describe the trend in the melting point when going down the group from lithium to rubidium.

.....

.....[1]

(b) **(i)** Using Table 19, which metal(s) would sink in water, given that the density of water is 1 g/cm^3.

.....[1]

(ii) A small piece of sodium metal has a volume of 10 cm^3.

With the information provided in Table 19, calculate the mass of this piece of sodium metal.

mass = ...g [1]

20 Fig. 20 shows the solubility of carbon dioxide in water at various temperatures.

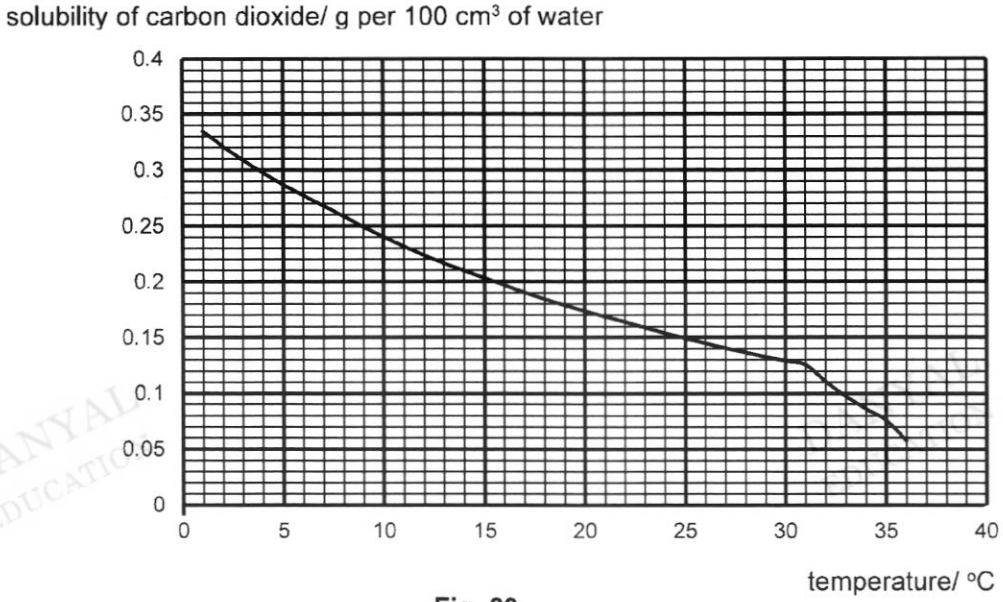


Fig. 20

(a) Use Fig. 20 to answer the following questions.

(i) What is the maximum mass of carbon dioxide dissolved in 100 cm^3 of water at 25 °C?

mass of carbon dioxide = ... g [1]

(ii) At which temperature is there only 0.1 g of carbon dioxide dissolved in 100 cm^3 of water?

temperature = ... °C [1]

(iii) Describe the how the solubility of carbon dioxide in water changes with temperature.

.....

.....[1]

(b) Carbon sinks, such as oceans and forests, absorb carbon dioxide from the earth's atmosphere. This helps to regulate the earth's surface temperature as carbon dioxide is a greenhouse gas which traps heat in the earth's atmosphere, keeping the earth warm.

(i) Using Fig. 20, predict how the level of carbon dioxide in the earth's atmosphere would change if the ocean temperature continues to increase.

.....

.....[1]

(ii) From your answer in part **(b)(i)**, describe how the change would affect the earth's surface temperature.

.....

.....[1]

End of Paper

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: 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.)

WOODLANDS SECONDARY SCHOOL
WEIGHTED ASSESSMENT 2019
MARKING SCHEME

Level:	Sec One	Marks:	45
Stream:	Exp	Date:	13 May 2019
Subject:	LSS	Day:	Monday

MCQ (10 marks) **delete unused columns*

1	B
2	C
3	A
4	B
5	B
6	A
7	A
8	C
9	D
10	B

Section A (35 marks)

11		Total = 4
(a)	Circle: eyes AND Explanation: By not wearing safety goggles, the chemical may spurt and enter her eyes. Circle: food AND Explanation: The food may become contaminated and unsafe for consumption.	1 1
(b)	Non-luminous flame. It is hotter / steadier / produces less soot. *Spelling should be correct.*	1 1

12		Total = 2
(a)	Glass is transparent or clear/ transparency	1
(b)	Metal is strong or has high strength/ strength	1

13					Total = 3
		apparatus	**quantity measured**	**S.I. unit**	3
	(a)	thermometer	temperature	Kelvin	
	(b)	electronic balance	mass	kilogram	
	(c)	digital stopwatch	time	second	
	Each row 1 mark.				

14		Total = 2
(a)	3.28	1
(b)	6.90	1

15		Total = 4
(a)	Element	1
(b)	Compound	1
(c)	Compound	1
(d)	Mixture	1

16		otal = 3
(a)	To ensure smooth boiling.	1
(b)	The vapour cools and condenses into droplets / liquid/ (pure) water in the condenser.	1
(c)	Above 100 but below 130 °C (value should be closed to 100 °C but not 100 °C because it is not a pure substance. Mixtures boil over a range of temperatures.)	1

17		Total = 3
	Add water to the mixture containing X, Y and Z to dissolve Z. Filter the mixture to collect the filtrate containing substance Z/ remove the residue. Heat the filtrate to dryness to obtain dry samples of Z/ to evaporate off all the water. *Reject 'filter the solution'.*	1 1 1

18		Total = 5
(a)	1. The higher the pH of soil, the better the growth of radish plant. 2. The lower the pH of soil, the better the growth of radish plant. 3. pH of soil affects the growth of radish plant. 4. Radish plant grows best at pH 6. *Allow other words to the same effect. Allow any reasonable hypothesis.*	1
(b)	dependent variable: height of radish plant independent variable: pH of soil	1 1
(c)	Volume of water given/ amount of sunlight/ temperature of the surrounding *(any two)* *Reject vague answers like 'location' or 'place'.*	1
(d)	For hypothesis 1: Increasing pH of soil does not result in an increased growth of radish plant. For hypothesis 2: Increasing pH of soil does not result in an increased growth of radish plant. For hypothesis 3 and 4: Radish plant grows best when the soil is at pH 6. *Reject: "pH of soil does affect the growth of radish plant" as it is too vague and does not explain how pH affects the growth* *Conclusion must be linked to hypothesis.*	1

19		Total = 6
(a)(i)	Group I *Reject '1' or l*	1
(a)(ii)	The melting point of metals decreases down the group from sodium to rubidium.	1
(b)(i)	Rubidium	1
(b)(ii)	9.7 g	1

20		Total = 5
(a)(i)	0.15 g	1
(a)(ii)	32.5 to 33 °C	1

(a)(iii)	As temperature increases, the solubility of carbon dioxide in water decreases. *Allow other words to the same effect.*	1
(b)(i)	As ocean temperature increases, solubility of carbon dioxide decreases (less carbon dioxide can be dissolved in the water), and hence the <u>level of carbon dioxide in the atmosphere increases.</u>	1
(b)(ii)	With more carbon dioxide in the atmosphere, the earth's surface <u>temperature increases</u> as well. *(note that carbon dioxide is a greenhouse gas which traps heat)*	1