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BEATTY SECONDARY SCHOOL
END-OF-YEAR EXAMINATION 2019

SUBJECT : LOWER SECONDARY SCIENCE

LEVEL : 2 N(T)

DURATION : 2 HOUR

SETTER : MS FERNANDEZ PAULINE

DATE : 7 OCTOBER 2019

CLASS :	NAME :	REG NO :
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.....

READ THESE INSTRUCTIONS FIRST

Write your name and register number on all the work you hand in.
Write in dark blue or black pen on both sides of the paper.
You may use a pencil for any diagram or graphs.
Do not use staples, paper clips, glue or correction fluid.

Section A

There are 40 questions in this section. Answer **all** questions.
Each multiple choice question is worth 1 mark.
Record your choice in soft pencil on the answer sheet (OTAS).

Section B

Answer all the questions. Write answers in the spaces provided. Show all necessary working.

AT THE END OF THE EXAMINATION

Submit Section A, Section B and the OTAS separately

INFORMATION FOR CANDIDATES

You are allowed to use a calculator.

	Marks
Section A [40m]	
Section B [60m]	
Total [100m]	

SECTION A: MULTIPLE CHOICE QUESTIONS [40 marks]

Answer ALL the questions on the OTAS provided.

- 1 What property is being described by the paragraph below?

Two similar balls are dropped into a pool. One of them is made of metal; the other is made of wood. The wooden ball floats while the metal ball sinks.

- A density
- B elasticity
- C hardness
- D solubility

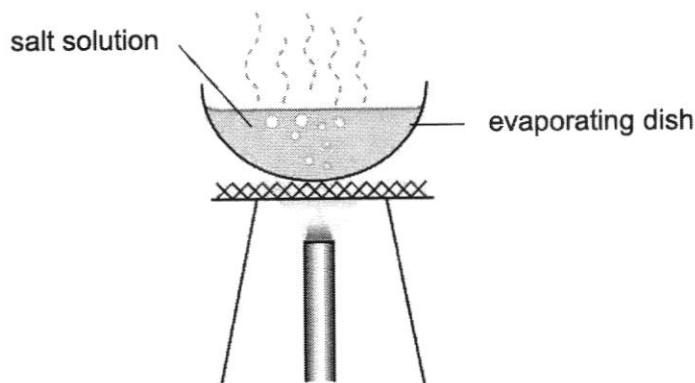
- 2 In a move to reduce the number of plastic bags used in Singapore, consumers are encouraged to bring their own bags to carry their groceries. What property should such bags have in order to carry the heavy groceries?

- A flexible
- B hard
- C high melting point
- D strong

- 3 Darren wants to separate chalk powder and salt from a mixture of chalk powder and salt solution. What are the separation techniques he should use?

- A boiling and evaporation
- B condensation and evaporation
- C filtration and condensation
- D filtration and evaporation

- 4 The diagram shows the set-up for a separation technique. What is this separation technique known as?



- A evaporation
- B filtration
- C sedimentation
- D solution

- 5 Which does **not** involve a change in state?
- A cutting paper
 - B droplets forming on a cold can of sprite
 - C freezing water
 - D hanging wet clothing out to dry
- 6 Which is **not** a matter?
- A alcohol
 - B biscuit
 - C oxygen
 - D sound
- 7 Mixture **X** is a suspension. Which statement best describes the property of mixture **X**?
- A It allows light to pass through.
 - B Its particles are small enough to pass through the filter paper.
 - C Its particles settle at the bottom upon standing.
 - D It is uniform throughout.
- 8 What is the most commonly used solvent?
- A alcohol
 - B petrol
 - C vinegar
 - D water
- 9 Mrs Judy and her two students, Michelle and Abby, are sorting out the things their schoolmates brought to school to donate to the needy people in a third world country. They studied the properties of the materials from three of the things donated and found the following information:

material K	Can be spun and woven, dyed into different colours.
material L	Strong and light. Poor conductor of heat and electricity.
material M	Hard but brittle. Poor conductor of heat and electricity.

Which one of the following groups of materials could materials **K**, **L** and **M** belong to?

	material K	material L	material M
A	fibres	plastics	ceramics
B	plastics	fibres	ceramics
C	plastics	ceramics	fibres
D	fibres	ceramics	plastics

- 10 Which will result in the **least** amount of solute dissolved in a solvent in the same amount of time?
- A high temperature with no stirring
 - B high temperature with stirring
 - C low temperature with no stirring
 - D low temperature with stirring

For questions 11 to 12, refer to the table below.

Hydrangea flowers appear in different colours depending on the acidity of the soil. The table below shows how the colour changes when it is placed in soil of different pH.

pH	4.5	5.0	5.5	6.0	6.5	7.0	7.5
colour of hydrangea flowers	blue		purple		violet	pink	

- 11 What colour are hydrangea flowers when growing in soil of pH 5.7?
- A blue
 - B pink
 - C purple
 - D violet
- 12 Due to air pollution, acid rain fell on a plot of hydrangea flowers. What will be the likely colour of the flowers **not** affected by acid rain?
- A blue
 - B pink
 - C purple
 - D violet

- 13 Study the table below.

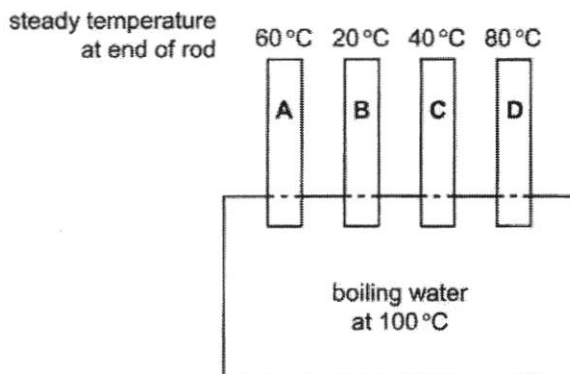
substance	amount of solute dissolved /g	volume of water used / cm ³
W	46	100
X	38	100
Y	20	50
Z	28	50

Which substance is **least** soluble in water at room temperature?

- A W
- B X
- C Y
- D Z

- 14 70 % of the Earth is covered with water. Of this 70 % approximately how much can be used for drinking?
- A 2.5 %
 - B 20.5 %
 - C 25 %
 - D 10 %
- 15 During the production of Newater, viruses and bacteria are removed through
- A adding acid.
 - B adding chlorine.
 - C microfiltration.
 - D reverse osmosis.
- 16 Which will **not** reduce the impact of water pollution?
- A cleaning up polluted rivers and beaches
 - B clearing rubbish from canals
 - C providing bins along waterways
 - D throwing away rubbish only into small drains
- 17 Which situation is **not** example of water pollution?
- A Adding chlorine to kill germs in our drinking water.
 - B Releasing chemical wastes from factories into nearby rivers.
 - C Spillage of oil from an oil tanker accident in the sea.
 - D Throwing food wrapper and unwanted food into the drain.
- 18 Which option is **not** one of the National Taps in Singapore?
- A desalinated water
 - B local catchment areas such as reservoirs
 - C mineral water
 - D NEWater
- 19 The Land Transport Authority has suggested a 'car-lite' approach with greater emphasis on public transportation. What is an effect of more people taking public transport?
- A decreased number of water vapour in the air
 - B greater number of electric cars on the roads
 - C less pollutants like oxides of nitrogen in the air
 - D less water pollutant such as oil spills
- 20 A factory was asked to stop releasing acidic gases into the air or face expensive fines. What measure can be taken to reduce the amount of acidic gases released?
- A bubble the gases into a stronger acid
 - B bubble the gases into an alkali
 - C trap the gases and bury it
 - D trap the gases and release it in another country

- 21 The harmful effects caused by haze does **not** include
- A breathing difficulties
 - B eye irritation
 - C rapid growth of algae
 - D reduced visibility
- 22 What is the main source of carbon monoxide?
- A Fumes from power plants
 - B Lightning
 - C Motor vehicle exhaust fumes
 - D Volcanic eruption
- 23 Which instrument is best used to record the temperature of water in a fish tank overnight?
- A clinical thermometer
 - B data logger
 - C infrared ear thermometer
 - D laboratory thermometer
- 24 The diagram shows four rods (**A**, **B**, **C** and **D**) each made of a different material. One end of each rod is in contact with boiling water and the other reaches the steady temperature shown. Which rod is the **best** insulator of heat?



- 25 Which expands the **most** when heated?
- A copper
 - B green tea
 - C oxygen
 - D plastic

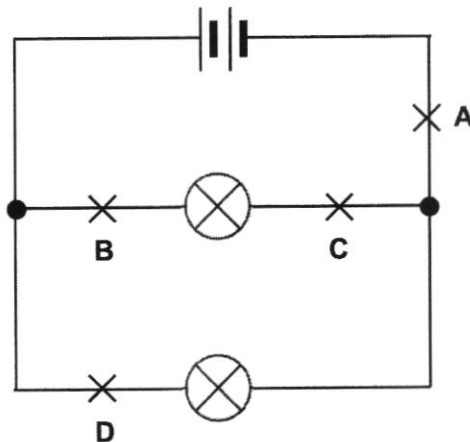
- 26 A housewife is unable to open the metal cap of a bottle of chilli. What can she do to unscrew the cap?
- A cool down the cap only
 - B heat up both the bottle and the cap
 - C heat up the bottle only
 - D heat up the cap only
- 27 Heat is a form of energy that
- A flows from a colder to a hotter region.
 - B flows from a hotter to a colder region.
 - C moving objects have.
 - D only hot objects have.
- 28 When the temperature of a solid decreases,
- A the mass of the solid decreases.
 - B the mass of the solid increases.
 - C the volume of the solid decreases.
 - D the volume of the solid increases.
- 29 Expansion and contraction are effects of heat. These effects are
- A harmful.
 - B useful.
 - C both harmful and useful.
 - D neither harmful nor useful.
- 30 A cold spoon is placed in a cup of hot water. Which statement is correct?
- A Heat travels from the spoon to the water.
 - B Heat travels from the water to the spoon.
 - C Temperature travels from the spoon to the water.
 - D Temperature travels from the water to the spoon.
- 31 Which application of expansion is **not** useful?
- A causing overhead wires to become longer during hot days
 - B riveting two metal plates tightly together
 - C using a liquid-in-glass thermometer to measure temperature
 - D using a thermostat to control the temperature of an oven
- 32 What are ammeters used to measure and how are they connected in the circuit?

	use to measure	connected in circuit
A	current	parallel
B	current	series
C	voltage	parallel
D	voltage	series

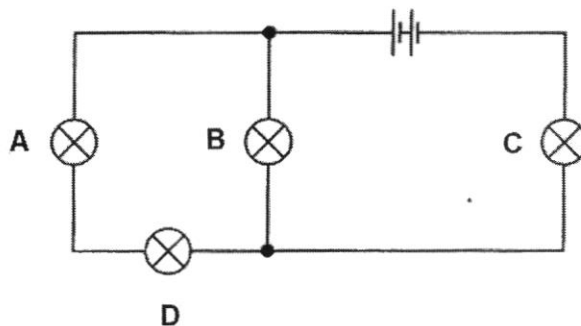
- 33 Which correctly describes a series circuit?
- A A series circuit has no paths for the current to flow.
 - B A series circuit has one or more paths for the current to flow.
 - C A series circuit has only one path for the current to flow.
 - D A series circuit has only two paths for the current to flow.
- 34 Which is most commonly used to produce electricity in Singapore power station?
- A burning of fossil fuels
 - B flowing water
 - C strong wind
 - D sunlight

- 35 The diagram shows a circuit.

In which position should a switch be placed so that **both** lamps can be switched on and off together?



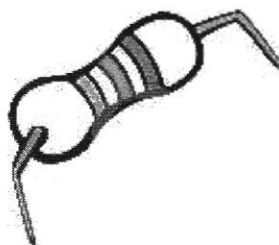
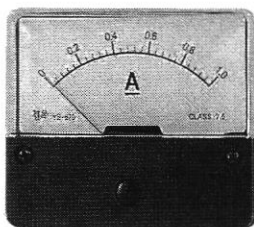
- 36 A circuit is set up as shown in the diagram. Which lamp, when damaged, will cause **all** lamps to stop working?



37 Which instrument can be used to measure resistance?

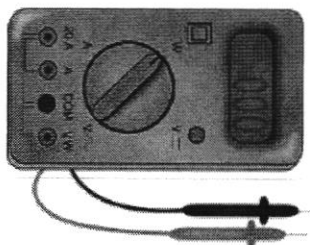
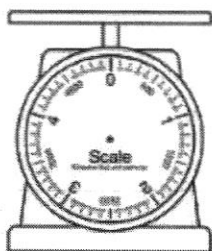
A ammeter

B resistor



C compression spring balance

D multimeter



38 Which correctly describes the electric lights in our homes?

- A They are connected in parallel.
- B They are connected in series.
- C They consume a lot of electricity.
- D They have high resistance.

39 Why is copper used to make wires?

- A It can conduct electricity.
- B It has a high boiling point.
- C It has a high melting point.
- D It is shiny.

40 The table below shows various objects.

metal spoon	rubber boots
aluminium foil	paper plate
glass beaker	plastic handphone casing
iron grilles	leather wallet

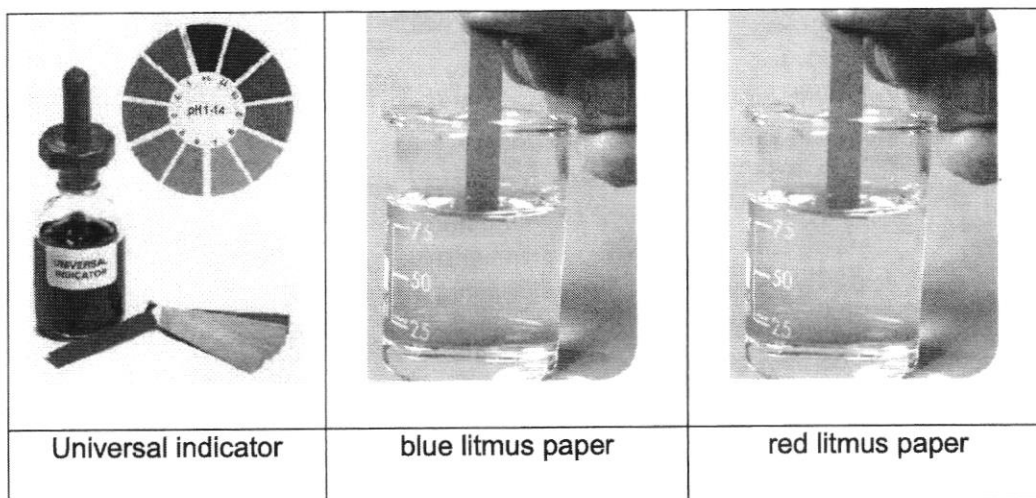
How many of the following objects are good conductors of electricity?

- A 3
- B 4
- C 7
- D 8

SECTION B: STRUCTURED QUESTIONS [60 marks]

Answer **ALL** questions. Write your answers in the spaces provided. Show all necessary working.

- 1 Indicators are used to find the nature of a solution if it is acidic, alkaline or neutral. Three common indicators are Universal indicator, blue litmus paper and red litmus paper as shown below.



Kelly added all three indicators to 3 different solutions **X**, **Y** and **Z**. The table below shows her results of the colour change after each indicator is added.

solution	colour change of Universal indicator	colour change of blue litmus paper	colour change of red litmus paper
X	red	from blue to red	stays red
Y	blue	stays blue	from red to blue
Z	green	stays blue	stays red

- (a) State **one** property of acid and **one** property of alkali.

acid:

.....

alkali:

.....

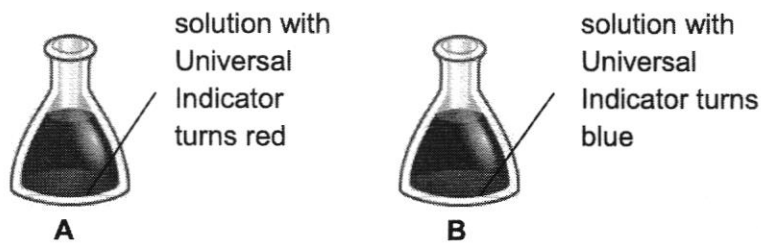
[2]

- (b) **Circle** the correct nature of the 3 different solutions **X**, **Y** and **Z** in the table given below.

solution	nature of solution
X	acidic / alkaline / neutral
Y	acidic / alkaline / neutral
Z	acidic / alkaline / neutral

[3]

- (c) Johnson is given two solutions **A** and **B**. Two drops of Universal Indicator is added into both solutions.



The pH scale uses the numbers 1 to 14. Give the possible pH value of solutions **A** and **B**.

Solution **A**:

[1]

Solution **B**:

[1]

Total: 7 marks

- 2 Marie wanted to make some tea for herself. Firstly, she mixed some sugar in the water.

- (a) What are the three things that she can do so that the sugar can dissolve as fast as possible? **Circle** the correct answer.

(i) She can use bigger / smaller pieces of sugar.

[1]

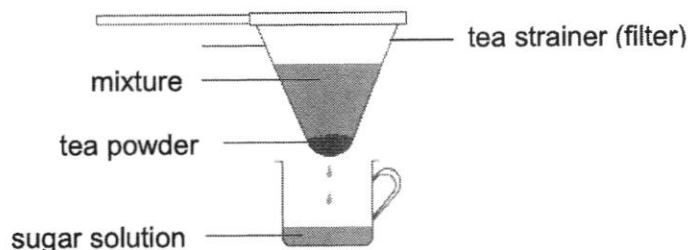
(ii) She can leave / stir the solution.

[1]

(iii) She can use cold / hot water to dissolve the solution.

[1]

- (b) After making the sugar solution, Marie added the tea powder and mixed well. She realized that the tea powder did not dissolve in the mixture. She wanted to remove the insoluble tea powder using the method shown below.



- (i) State the method shown in the diagram above.

..... [1]

- (ii) What is the name given to the tea powder that remained in the filter?

..... [1]

- (iii) What is the name given to the sugar solution collected in the cup?

..... [1]

Total: 6 marks

- 3 (a) When an oil tanker is damaged at sea, there will be a massive oil spill.



With reference to the picture above, explain how the oil spill affect the aquatic life.

.....

 [2]

- (b) With reference to the picture below, state **two** actions the government can take to prevent activities that pollute water.



action 1:

.....

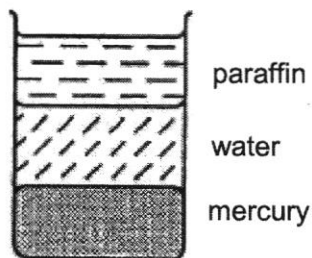
action 2:

.....

[2]

Total: 4 marks

- 4 The diagram shows a beaker containing three liquids which do not mix.



Match the following densities to the correct liquids.

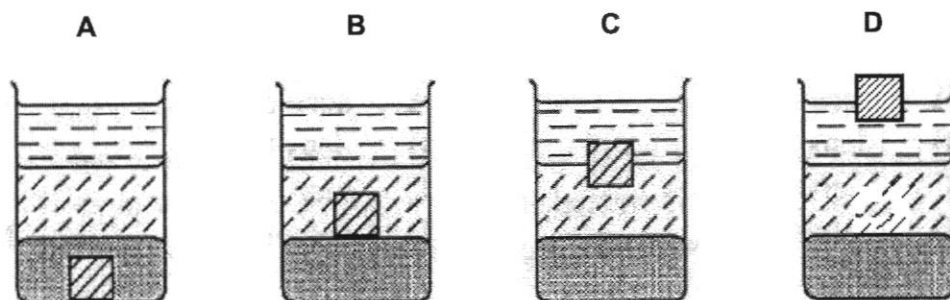
(a) Density 0.8 g/cm^3 :

Density 1.0 g/cm^3 :

Density 13.6 g/cm^3 :

[3]

- (b) A small block () of density 12.4 g/cm^3 is carefully dropped into the beaker.

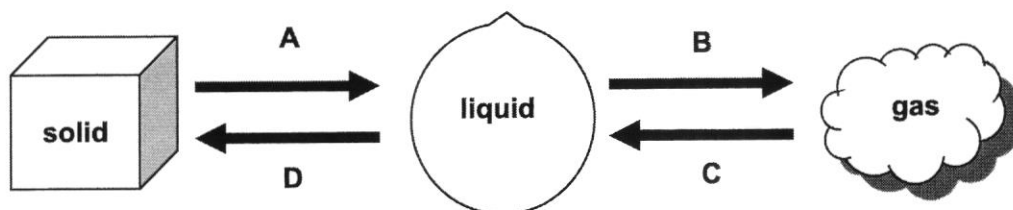


Which diagram shows the final position of the block?

[1]

Total: 4 marks

- 5 (a) The figure below shows four stages; **A**, **B**, **C** and **D**. These stages show the changes between the three states of matter.



Match the following stages to the correct processes.

stage

process

A

•

• boiling

B

•

• condensing

C

•

• freezing

D

•

• melting

[4]

- (b) **Circle** whether heat is gained or lost in each process.

(i) melting of candle wax: heat is gained / lost

[1]

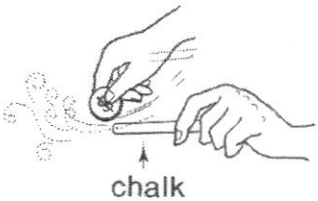
(ii) steam forming vapour on a cool surface: heat is gained / lost

[1]

Total: 6 marks

- 6 The table below shows some physical properties of matter. Using the helping words given, identify the physical property correctly.

density	elasticity	hardness	melting point
---------	------------	----------	---------------

description of property	diagram or formula	physical property
The mass per unit volume of a substance.	$\text{mass} \div \text{volume}$	
The temperature at which a substance changes from solid to liquid.		
The ability to withstand scratches.	 chalk	
The ability of a substance to return to its original shape and size after being bent, stretched or compressed.		

[4]

Total: 4 marks

7 Study the cartoon below.



- (a) What happened to the iceberg in the cartoon above?

..... [1]

- (b) The situation in the cartoon above is mainly due to a condition where thermal energy is trapped within the earth by the excessive amount of greenhouse gases like carbon dioxide in the atmosphere.

Name the condition.

..... [1]

- (c) Suggest a human activity which causes the excessive amount of greenhouse gases in the atmosphere.

..... [1]

- (d) Describe how the situation in the cartoon above impacts the life of a polar bear.

.....

.....

..... [2]

Total: 5 marks

- 8 Fill in the table with an appropriate word. The first letter of each word is given.

name of pollutant	sources	effect of pollutant
Carbon monoxide	Motor v.....	Dizziness and headache
S..... dioxide	Factories	Causes a..... Rain.
Oxides of n.....	Lightning activities	Skin and eye irritation
Dust and s.....	Forest f.....	B..... difficulties

[4]

Total: 4 marks

- 9 (a) Choose a suitable type of material from the list to make the following items. You can use each word only once.

metal	glass	plastics	ceramics	fibre
-------	-------	----------	----------	-------



item	material used
Pot handle	
Pot body	

[2]

- (b) Explain why the pot handle and pot body are made of the material that you have chosen in (a).

.....

.....

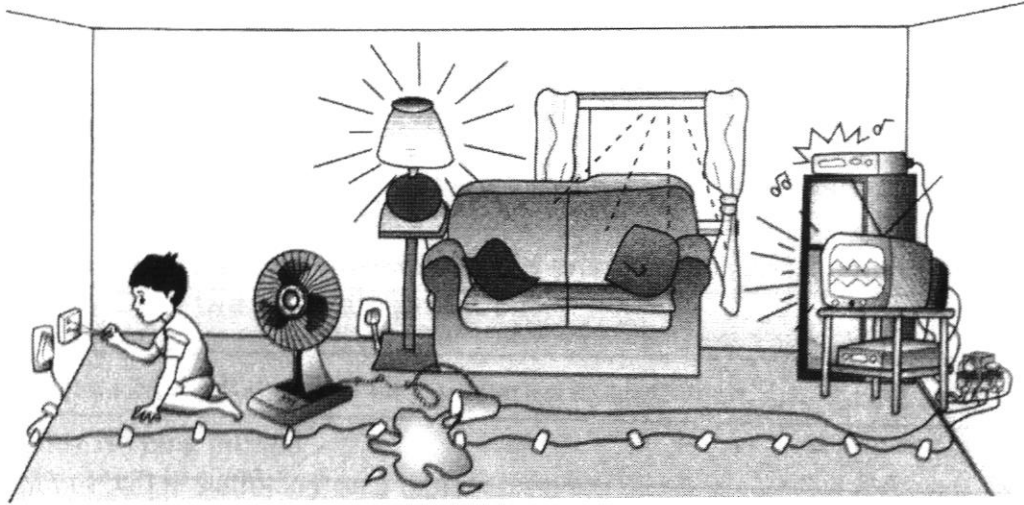
.....

.....

[2]

Total: 4 marks

- 10 The picture shows a boy in a living room with several electrical appliances.



- (a) Identify any **two** electrical hazards in the picture and **circle** them. [2]

- (b) Explain why each of the hazards identified in (a) is dangerous.

1.

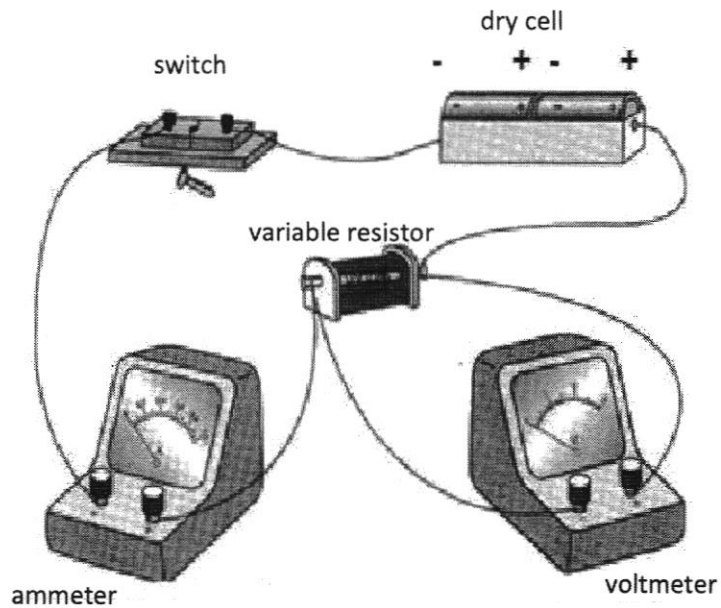
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2.

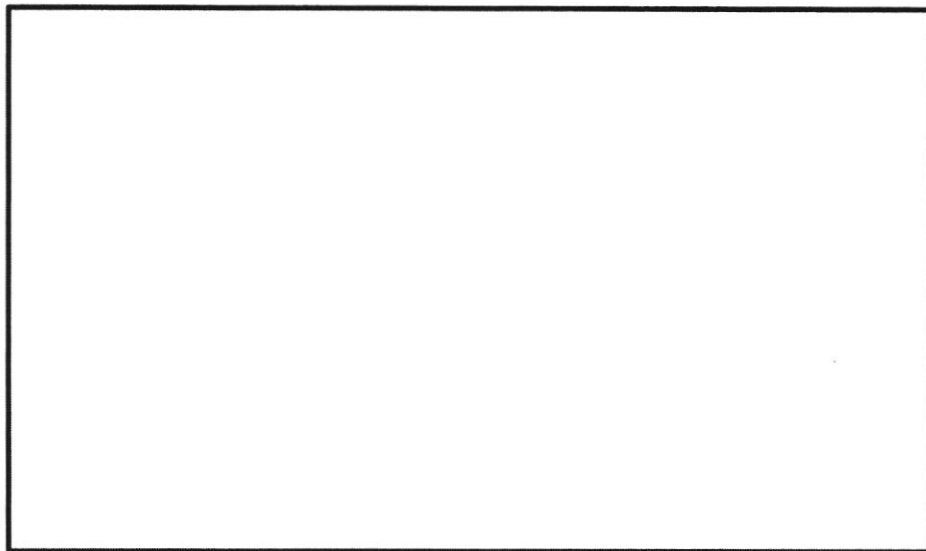
..... [2]

Total: 4 marks

- 11 The diagram below shows an electrical circuit set-up.

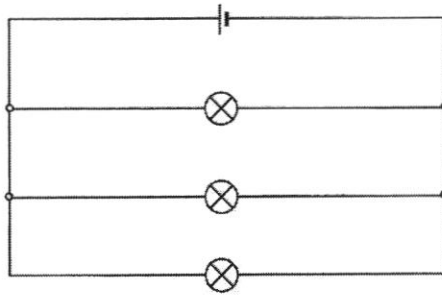


- (a) What do these instruments measure?
- (i) ammeter: [1]
- (ii) voltmeter: [1]
- (b) On the circuit diagram above, draw arrows to show the direction of electric current flow when the switch is closed. [1]
- (c) Using circuit symbols, draw a circuit diagram for the set-up shown above. [4]

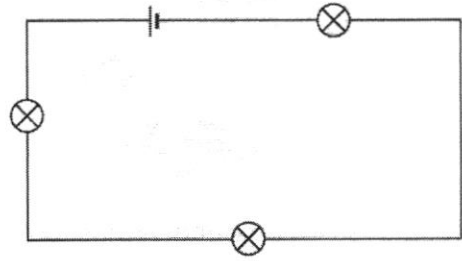


Total: 7 marks

- 12 (a) Ben wants to design a Christmas tree with colorful lightings. He fitted the light bulbs in two different ways, as shown in Circuit A and Circuit B.



Circuit A



Circuit B

Study the diagrams of Circuit A and Circuit B and decide which bulbs are arranged in **series** or **parallel**. Write your answers in the boxes above.

[1]

- (b) Will the other light bulbs work if one of the light bulbs blows in Circuit B? Explain your answer.

.....

.....

.....

.....

[2]

- (c) Which circuit should Ben choose to fit on his Christmas tree? Explain your answer.

.....

.....

.....

.....

[2]

Total: 5 marks

☺ End of Paper ☺

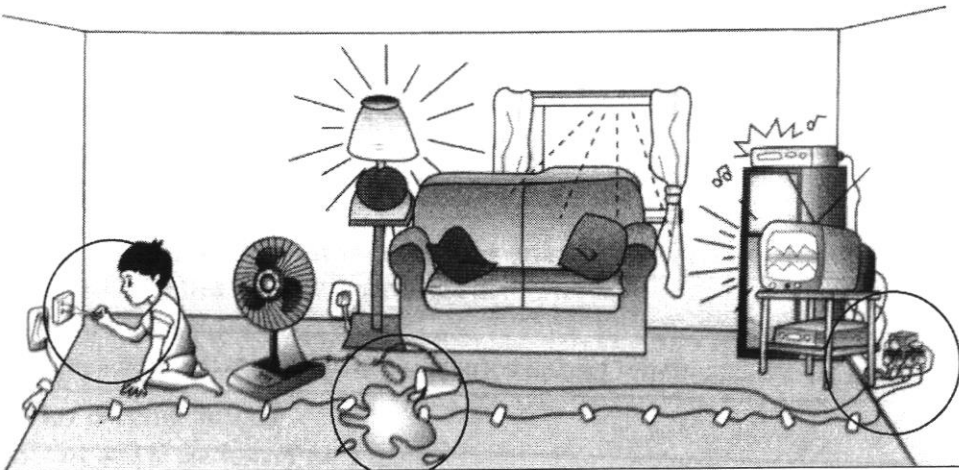
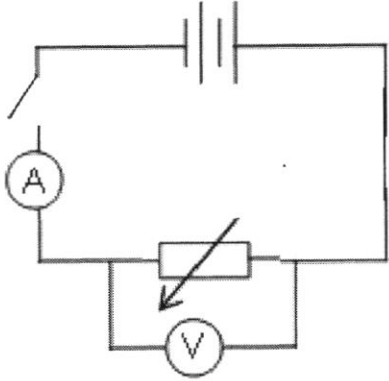
Paper 1 (20 marks)

1	2	3	4	5	6	7	8	9	10
A	D	D	A	A	D	C	D	A	C
11	12	13	14	15	16	17	18	19	20
C	B	B	A	D	D	A	C	C	B
21	22	23	24	25	26	27	28	29	30
C	C	B	B	C	D	B	C	C	B
31	32	33	34	35	36	37	38	39	40
A	B	B	A	A	C	B	A	A	A

Question		Answer	Marks	Total
1	a)	Acid: sour taste / pH less than 7 Alkali: soapy feel / pH more than 7	1 1	9
	b)	X: acidic Y: alkaline Z: neutral	1 1 1	
	ci)	Blue to red	1	
	cii)	Red to blue	1	
	d)	A: any value less than 7 B: any value more than 7	1 1	
2	ai)	Smaller	1	6
	aii)	Stir	1	
	aiii)	Hotter	1	
	bi)	Filtration	1	
	bii)	Residue	1	
	biii)	Filtrate	1	
3	a)	Oil, when coated on the feathers of sea birds, - can affect their ability to fly and keep warm/ - Oil may clog up the gills of fishes and cause them to suffocate and die. Or Oil forms a layer on the water surface and prevents the air from entering the water. The aquatic animals die due to the lack of oxygen.	1 1 or 1 1	4
	b)	educate the public through campaigns on the importance of clean waterways enforce laws to prevent people and industries from polluting our waterways	1 1	
4	a)	Density 0.8 g /cm ³ = paraffin Density 1.0 g /cm ³ = water Density 13.6 g /cm ³ = mercury	1 1 1	4
	b)	C	1	

[Turn Over]

5	a)	Density Melting point Hardness Elasticity	1 1 1 1	6																
	bi)	gained	1																	
	bii)	loss	1																	
6		A: melting B: boiling C: condensing D: freezing																		
7	a)	It melted.	1	5																
	b)	Global warming	1																	
	c)	The use of motor vehicles/ burning of forests	1																	
	d)	The excessive amounts of carbon dioxide in the atmosphere traps heat from the sun and caused the iceberg to melt. Hence, the polar bear has loss its habitat.	1 1																	
8	<table><tr><th>Name of pollutant</th><th>Sources</th><th>Effect of Pollutant</th></tr><tr><td>Carbon Monoxide</td><td>Motor <u>Vehicle</u></td><td>Dizziness and headache</td></tr><tr><td><u>Sulfur</u> Dioxide</td><td>Factories</td><td>Causes <u>acid</u> Rain.</td></tr><tr><td>Oxides of <u>Nitrogen</u></td><td>Lightning activities</td><td>Skin and eye irritation</td></tr><tr><td>Dust and <u>soot</u></td><td>Forest <u>fire</u></td><td><u>Breathing</u> difficulties</td></tr></table>			Name of pollutant	Sources	Effect of Pollutant	Carbon Monoxide	Motor <u>Vehicle</u>	Dizziness and headache	<u>Sulfur</u> Dioxide	Factories	Causes <u>acid</u> Rain.	Oxides of <u>Nitrogen</u>	Lightning activities	Skin and eye irritation	Dust and <u>soot</u>	Forest <u>fire</u>	<u>Breathing</u> difficulties	1 1 1 1	4
Name of pollutant	Sources	Effect of Pollutant																		
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Oxides of <u>Nitrogen</u>	Lightning activities	Skin and eye irritation																		
Dust and <u>soot</u>	Forest <u>fire</u>	<u>Breathing</u> difficulties																		
9	a)	Plastic metal	1 1	4																
	b)	The pot handle is made of plastic as it is a poor conductor of heat. Hence, when someone carries the pot by the handle, he will not get burnt. The pot body is made of metal which is good conductor of heat so that food can be cooked well is the pot.	1 1																	

10	a)		2	4
	b)	Overloading may cause fire; Damp conditions can cause electrocution; Playing with socket may get you electrocuted;	1 1	
11	a)	Current voltage	1 1	7
	b)	Arrows from from + to -	1	
	c)	 1 mark for correct symbols. 1 mark for open switch. 1 mark for correct battery configuration. 1 mark for connecting voltmeter across the resistor.	4	
12	a)	Circuit A=parallel Circuit B = series	1	5
	b)	if one of the light bulbs blows current cannot flow as it will be an open circuit all the bulbs will not light up	1 1	
	c)	Circuit A- current can flow and light up the other bulbs Ben needs to replace the faulty bulb and the Christmas tree will light up	1 1	