

NAMIBIA SENIOR SECONDARY CERTIFICATE

PHYSICAL SCIENCE ORDINARY LEVEL

4323/1

PAPER 1 Multiple Choice

1 hour

Marks 40

2018

Additional Materials: Multiple choice answer sheet
Non-programmable calculator
Soft clean eraser
Soft pencil (type B or HB is recommended)

INSTRUCTIONS AND INFORMATION TO CANDIDATES

- Write in soft pencil.
- Make sure that you receive the multiple choice answer sheet with **your examination number** on it.
- There are **forty** questions on this paper. Answer **all** questions.
- For each question, there are four possible answers **A, B, C** and **D**. Choose the **one** you consider correct and record your choice in soft pencil on the separate answer sheet.
- If you want to change an answer, thoroughly erase the one you wish to delete.
- The Periodic Table is printed on page 14.
- **Read the instructions on the answer sheet carefully.**
- Each correct answer will score one mark.
- Any rough working should be done in this booklet.
- All questions in this paper carry equal marks.
- You may use a non-programmable calculator.

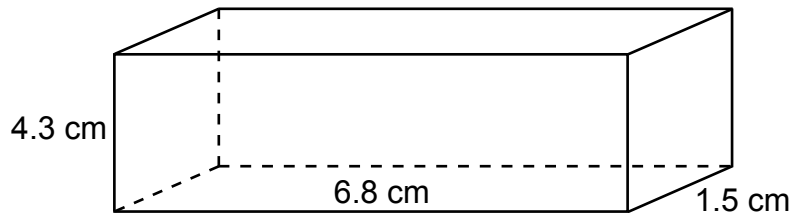
This document consists of **14** printed pages and **2** blank pages.



Republic of Namibia

MINISTRY OF EDUCATION, ARTS AND CULTURE

- 1 Which instrument can be used to measure the volume of a liquid accurately?
- A balance
B beaker
C burette
D thermocouple
- 2 The diagram shows a rectangular glass block with dimensions 6.8 cm, 1.5 cm and 4.3 cm.



Which row in the table shows the correct combination of the length and area of base of the rectangular glass block?

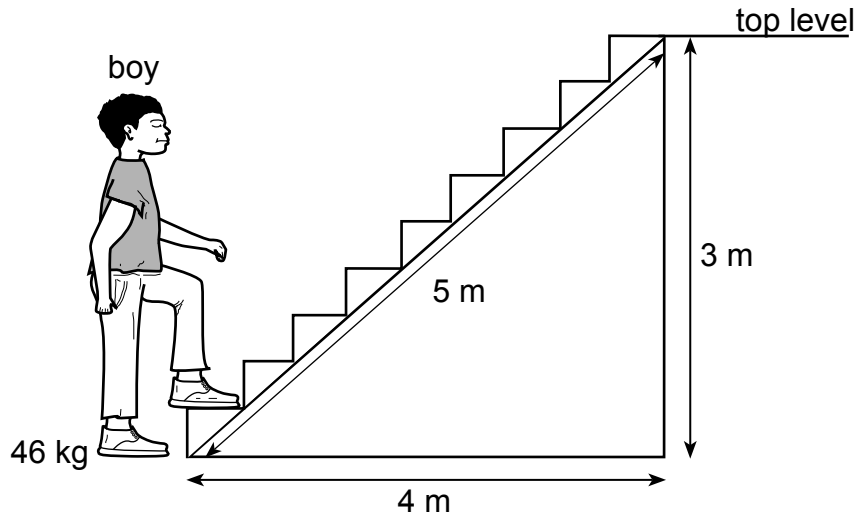
	length/cm	area of base/cm ²
A	4.3	6.45
B	4.3	10.2
C	6.8	6.45
D	6.8	10.2

- 3 Some water is contained in a beaker. Water has a maximum density at 4°C. Which row in the table explains this?

A	The mass of the water is at a maximum.	The volume of the water does not change.
B	The mass of the water is at a minimum.	The volume of the water is at a maximum.
C	The mass of the water remains a constant.	The volume of the water is at a maximum.
D	The mass of the water remains a constant.	The volume of the water is at a minimum.

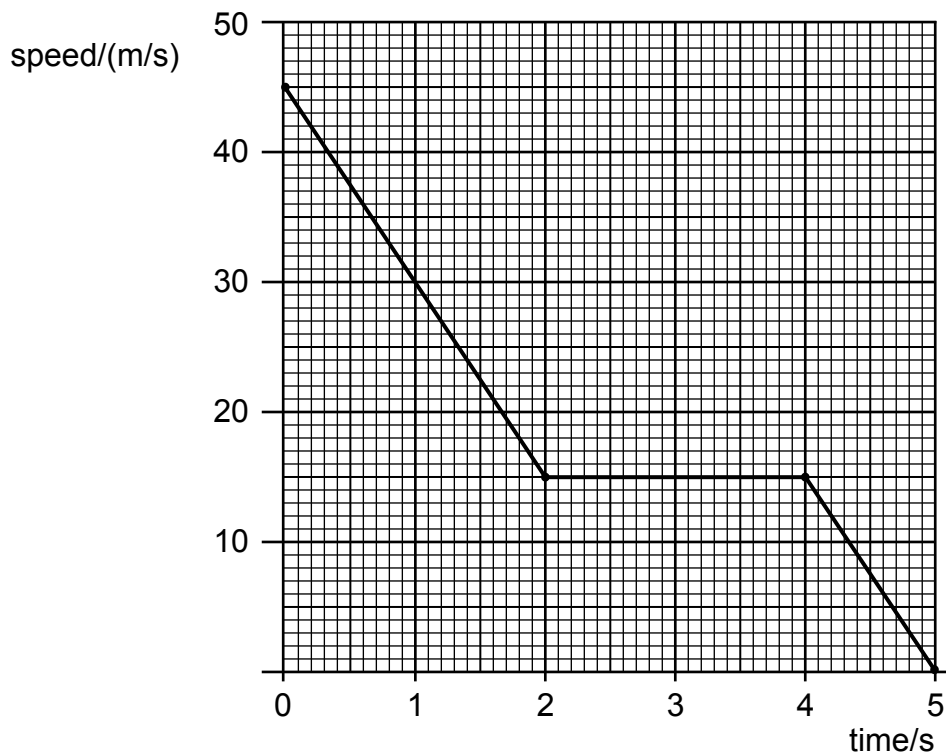
- 4 Which statement describes the moment of a force about a point?
- A The magnitude of the force divided by the perpendicular distance from the line of action of the force to the point.
- B The magnitude of the force multiplied by the distance moved by the point of action of the force perpendicular to its line of action.
- C The magnitude of the force multiplied by the distance moved by the point of action of the force in the direction of the force.
- D The magnitude of the force multiplied by the perpendicular distance from the line of action of the force to the point.

- 5 A boy of mass 46 kg takes 5 s to climb some stairs.



What is the useful power output of the boy?

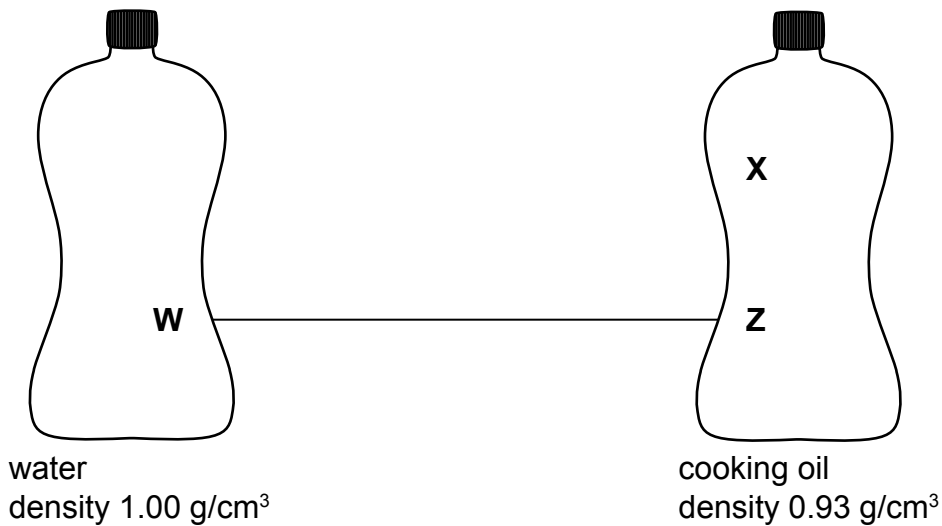
- A 138 watts
 B 276 watts
 C 368 watts
 D 460 watts
- 6 The speed time graph shows the motion for part of a journey of a car.



What is the total distance travelled?

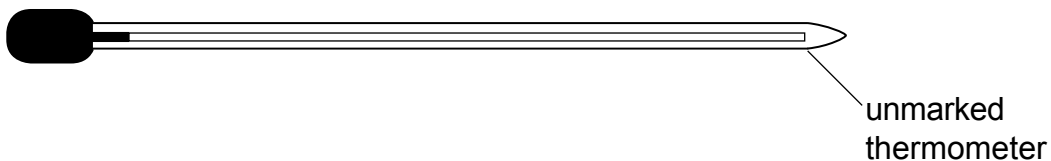
- A 37.5 m
 B 50.0 m
 C 97.5 m
 D 175.0 m

7 The diagram shows two bottles.



Which statement is correct?

- A The pressure at **W** is equal to the pressure at **X**.
 - B The pressure at **W** is equal to the pressure at **Z**.
 - C The pressure at **W** is less than the pressure at **Z**.
 - D The pressure at **W** is greater than the pressure at **Z**.
- 8 The diagram shows an unmarked liquid-in-glass thermometer.

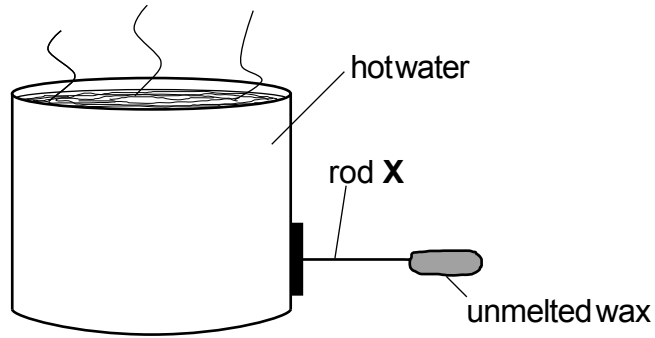


To mark a scale on a thermometer, standard temperatures known as fixed points are needed.

Which of these provides a suitable fixed point?

- A the room temperature
- B the temperature inside a freezer
- C the temperature of pure melting ice
- D the temperature of warm water

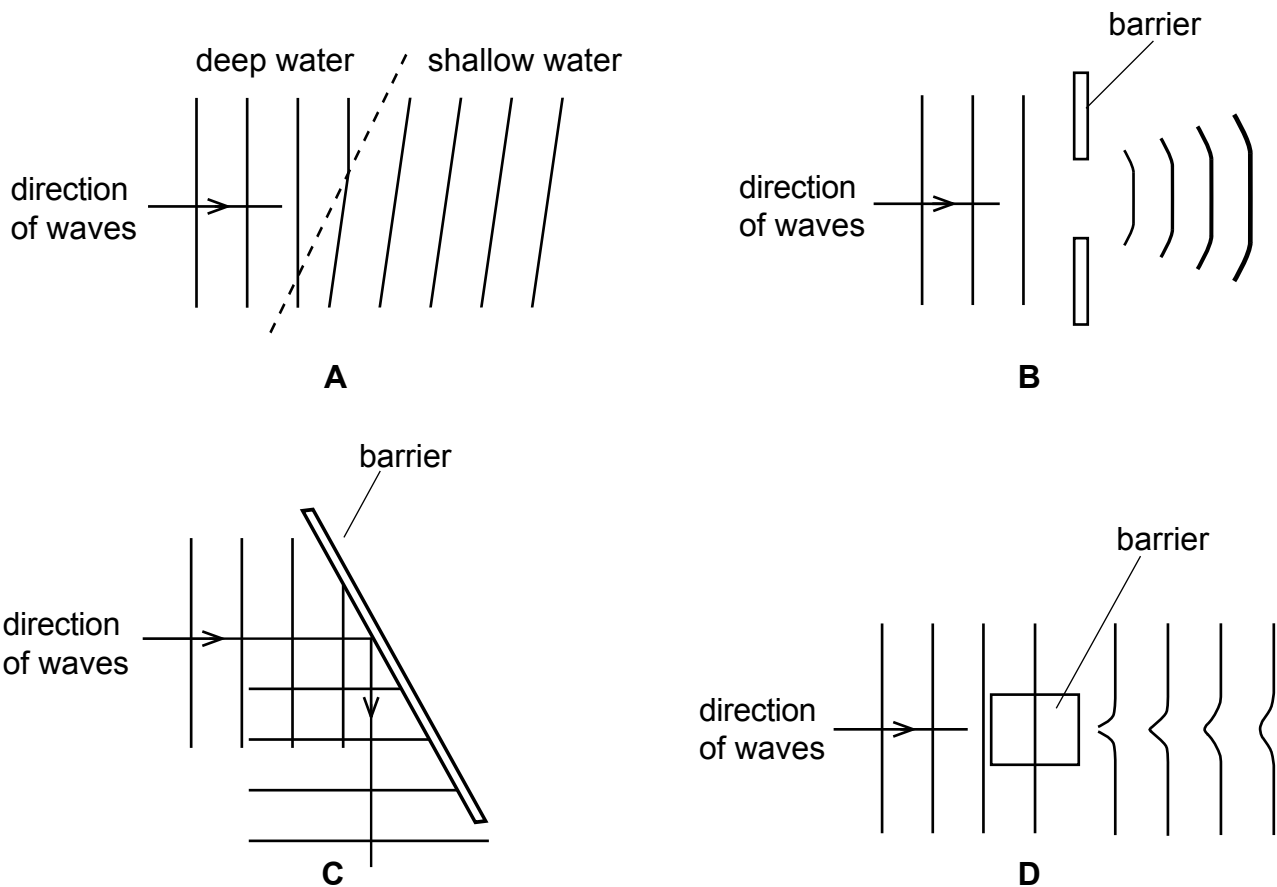
- 9 The diagram shows a can with a rod, **X**, sealed into one side. The rod is coated with wax and hot water is poured into the can. After a short time the wax is melted.



How is the heat transferred through the rod?

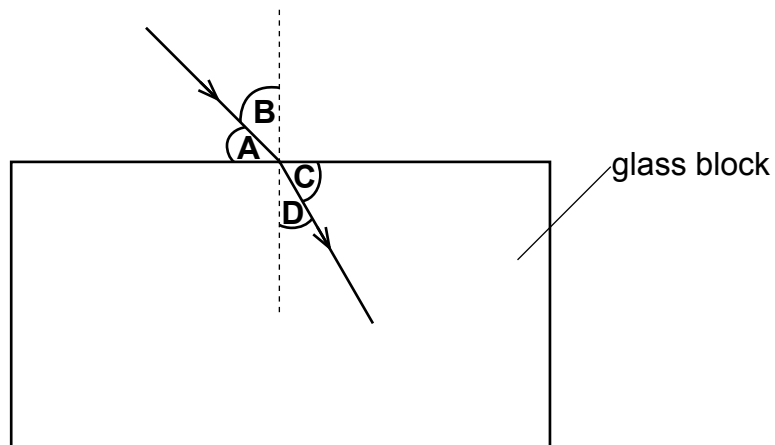
- A** by conduction and convection
B by conduction only
C by convection only
D by radiation only
- 10 The diagrams show water waves.

Which diagram represents the reflection of water waves?



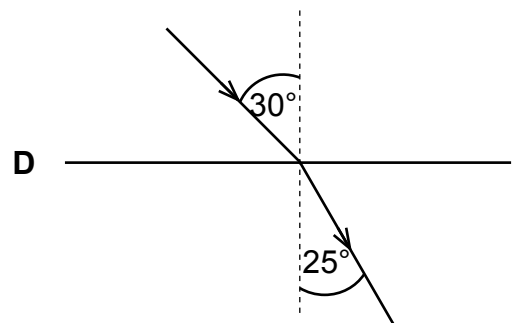
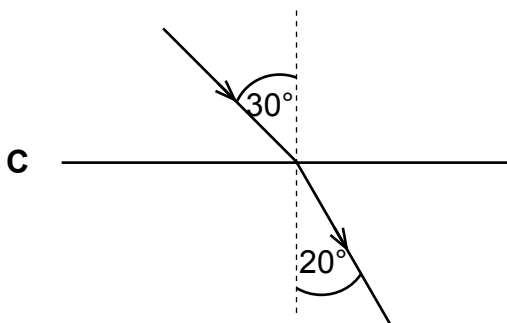
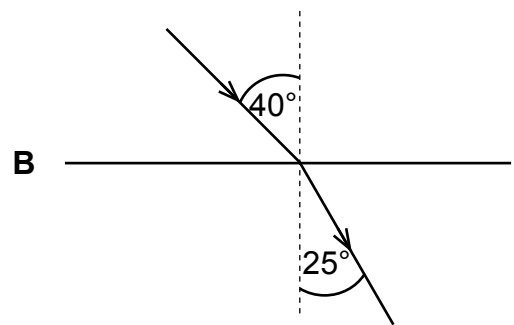
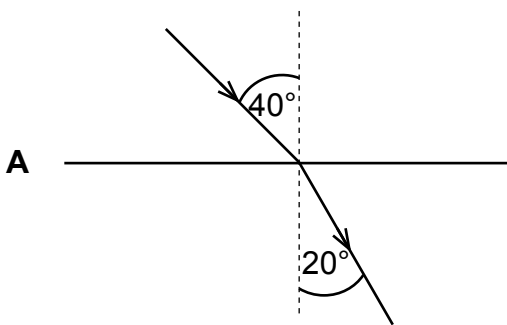
11 The diagram shows a light ray passing from air into a parallel sided glass block.

Which angle represents the angle of refraction?



12 The diagrams show rays of light passing through rectangular glass blocks made from different materials.

Which block is made from the material with a refractive index of 1.52?



13 What is the unit for resistance?

- A ampere
- B ohm
- C volt
- D watt

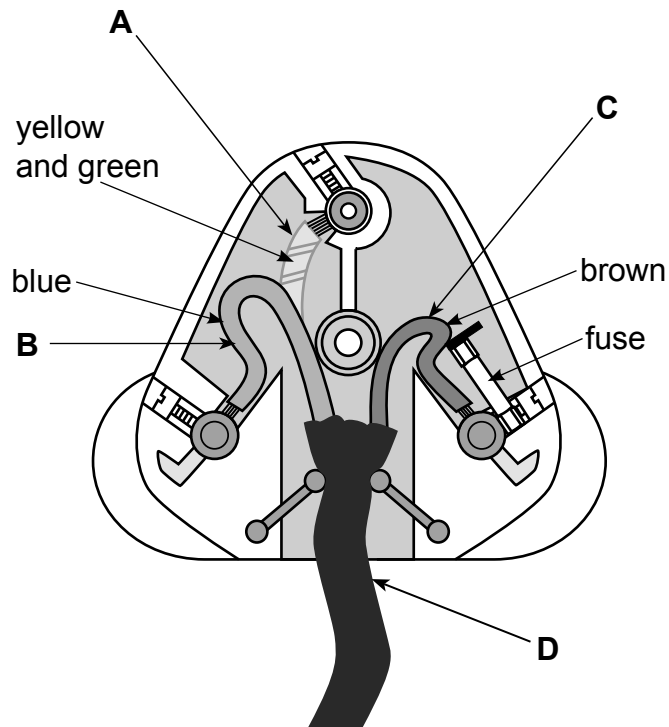
14 A charge of 10 C passes a point in 2 seconds.

What is the current?

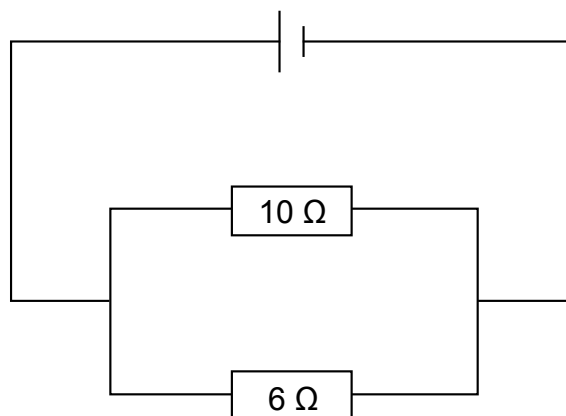
- A 0.2 A
- B 5.0 A
- C 12 A
- D 20 A

15 The diagram shows an electric plug.

Which part represents a live wire?



16 The diagram shows a circuit containing two resistors and a cell.

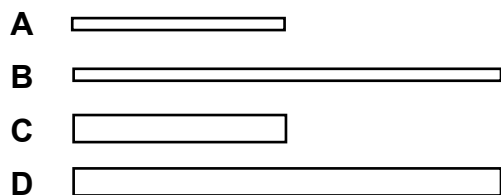


Which statement about the total resistance in the circuit is correct?

- A less than $6\ \Omega$
- B equal to $6\ \Omega$
- C equal to $10\ \Omega$
- D greater than $10\ \Omega$

- 17 The diagrams show pieces of wires used in an experiment to compare their resistance. The wires are made from the same electric conducting material.

Which wire will have the lowest resistance?



- 18 Domestic appliances use electricity in a variety of ways.

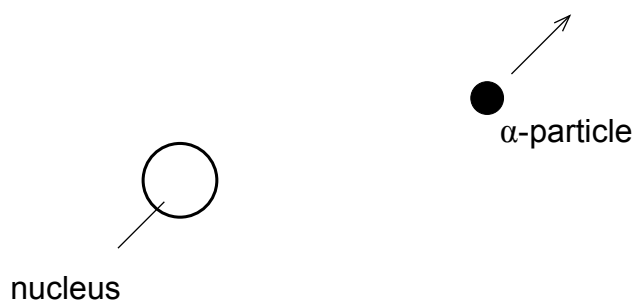
Which appliance includes both an electric motor and a heater?

- A hair dryer
 B kettle
 C light bulb
 D smoothing iron
- 19 A sample contains 200 μg of a radioactive isotope.

What mass of this isotope is left after four half-lives?

- A 6.25 μg
 B 12.5 μg
 C 50.0 μg
 D 100 μg

- 20 A radioactive nucleus emits an α -particle.



What will happen to the proton number and nucleon number?

	proton number	nucleon number
A	decrease by 2	decrease by 4
B	decrease by 2	stay the same
C	decrease by 4	decrease by 2
D	increase by 4	stay the same

21 A learner investigates how to obtain a salt and pure water from a sample of sea water.

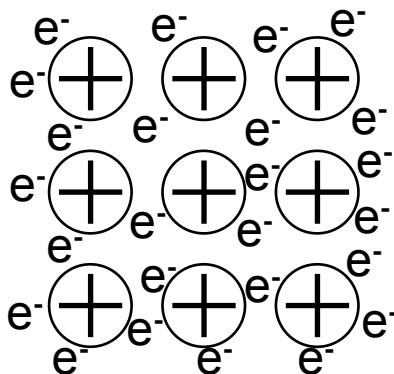
Which row shows the suitable methods?

	to obtain pure water	to obtain the salt
A	distillation	crystallisation
B	distillation	filtration
C	filtration	crystallisation
D	filtration	filtration

22 Which row shows the correct numbers of protons and neutrons for atoms of potassium, ${}_{19}^{39}\text{K}$ and fluorine, ${}_{9}^{19}\text{F}$?

	potassium		fluorine	
	protons	neutrons	protons	neutrons
A	19	20	9	10
B	19	20	9	9
C	19	19	9	10
D	20	19	9	9

23 Which type of bond is represented by the diagram?



- A** covalent
- B** electrostatic
- C** ionic
- D** metallic

24 Which statement describes isotopes of the same element?

	same	different
A	number of neutrons	number of protons
B	number of electrons	number of protons
C	number of protons	number of neutrons
D	number of neutrons	number of electrons

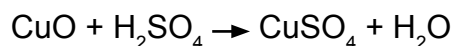
25 Which chemical equation is correct?

- A $\text{Na} + 2\text{HCl} \rightarrow \text{NaCl} + \text{H}_2$
 B $\text{Na} + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{H}_2\text{O}$
 C $2\text{Na} + \text{HCl} \rightarrow 2\text{NaCl} + \text{H}_2\text{O}$
 D $2\text{Na} + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{H}_2$

26 What is the relative formula mass of aluminium hydroxide, $\text{Al}(\text{OH})_3$?

- A 44
 B 78
 C 98
 D 132

27 The equation for the reaction between copper(II) oxide and excess dilute sulfuric acid is shown.



The M_r of CuSO_4 is 160, and that of CuO is 79.5

What is the mass of copper sulfate formed when 2.5 g of copper(II) oxide reacts with dilute sulfuric acid?

- A 1.25
 B 3.00
 C 4.08
 D 5.00

28 A spark can cause a mixture of hydrogen and air to explode.

Which statement describes the reaction?

- A endothermic where hydrogen is oxidised
 B endothermic where hydrogen is reduced
 C exothermic where hydrogen is oxidised
 D exothermic where hydrogen is reduced

29 Magnesium hydroxide is an alkali. It can react with nitric acid.

How does the pH of the magnesium hydroxide change as excess aqueous nitric acid is added?

- A** the pH decreases from 10 to 2
- B** the pH decreases from 10 to 7
- C** the pH increases from 1 to 7
- D** the pH increases from 1 to 10

30 Which element reacts with dilute hydrochloric acid to produce hydrogen gas?

- A** calcium
- B** carbon
- C** chlorine
- D** copper

31 Which properties only apply to transition elements?

- A** solids at room temperature
- B** having high densities
- C** forming variable valencies
- D** good conductors of electricity

32 The following is a list of metals.

1. gold
2. lead
3. silver
4. zinc

Which of the metals can be found freely in nature in sufficient quantities to be commercially useful?

- A** 1 and 2 only
- B** 1 and 3 only
- C** 1 and 4 only
- D** 3 and 4 only

33 Which row shows the correct combination of the ores of aluminium, iron and lead?

	aluminium	iron	lead
A	bauxite	galena	haematite
B	bauxite	haematite	galena
C	galena	haematite	bauxite
D	haematite	galena	bauxite

34 Which metal is matched with its correct use?

	metal	use
A	aluminum	galvanising iron
B	copper	electrical wires
C	tin	water pipes
D	iron	cooking foil

35 A pot used for boiling water, contains temporary hard water. After boiling the water, a white deposit, called scale is noticed in the pot.

Which compound causes the formation of scale?

- A calcium carbonate
- B calcium hydrogen carbonate
- C calcium hydrogen sulfate
- D calcium sulfate

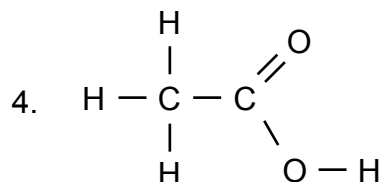
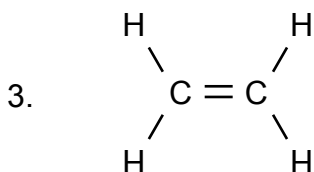
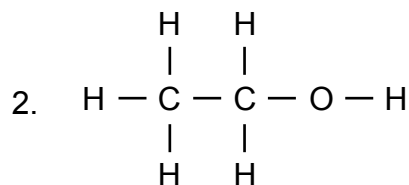
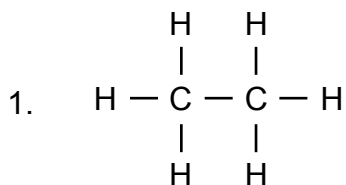
36 Which method is used to obtain oxygen from liquefied air?

- A chromatography
- B crystallisation
- C filtration
- D fractional distillation

37 What is the formula for carboxylic acid?

- A C_3H_6
- B C_3H_8
- C C_3H_7OH
- D C_2H_5COOH

38 The diagram shows four organic compounds.



Which of these compounds are hydrocarbons?

- A** 1 and 2 only
B 1 and 3 only
C 2 and 4 only
D 2, 3 and 4 only
- 39 Methane, sulfur dioxide and carbon dioxide are gases which affect the atmosphere and the environment.

In which ways do these gases affect the environment?

	methane	sulfur dioxide	carbon dioxide
A	depletion of ozone layer	acid rain	global warming
B	global warming	photochemical smog	acid rain
C	photochemical smog	global warming	depletion of ozone layer
D	global warming	acid rain	global warming

- 40 Which of the following gasses results from incomplete combustion of organic materials?
- A** carbon dioxide
B carbon monoxide
C sulfur dioxide
D nitrogen oxide

DATA SHEET																											
The Periodic Table of the Elements																											
Group																											
I	II	III	IV	V	VI	VII	0																				
7 Li Lithium 3	9 Be Beryllium 4	1 H Hydrogen 1	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	101 Ru Ruthenium 44	106 Pd Palladium 46	108 Ag Silver 47	112 Cd Cadmium 48	115 In Indium 49	119 Sn Tin 50	122 Sb Antimony 51	127 I Iodine 53	128 Te Tellurium 52	131 Xe Xenon 54											
133 Cs Caesium 55	137 Ba Barium 56		139 La Lanthanum 57	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	197 Au Gold 79	199 Pt Platinum 78	201 Hg Mercury 80	207 Pb Lead 82	209 Bi Bismuth 83	210 Po Polonium 84	210 At Astatine 85	210 Rn Radon 86											
87 Fr Francium	88 Ra Radium		226 Ra Radium 88	227 Ac Actinium 89																							
*58 - 71 Lanthanoid series											140 Ce Cerium 58	141 Pr Praseodymium 59	144 Nd Neodymium 60	146 Pm Promethium 61	150 Sm Samarium 62	152 Eu Europium 63	157 Gd Gadolinium 64	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	238 Pa Protactinium 91	238 U Uranium 92	238 Np Neptunium 93	238 Pu Plutonium 94	238 Am Americium 95	238 Cm Curium 96	238 Bk Berkelium 97	238 Cf Californium 98	238 Es Einsteinium 99	238 Fm Fermium 100	238 Md Mendelevium 101	238 No Nobelium 102	238 Lr Lawrencium 103			

a = relative atomic mass
X = atomic symbol
 b = proton (atomic) number

Key
 a
X
 b

The volume of one mole of any gas is 24 dm³ at room temperature and pressure (r.t.p.).

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