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6888/01

October/November 2012

1 hour

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen in the spaces provided on the Question Paper.

You may use a soft pencil for any diagrams, graphs, tables or rough working.

Do **not** use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.

You may use a calculator.

A copy of the Periodic Table is printed on page 12.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

For Examiner's Use

This document consists of **11** printed pages and **1** blank page.

In questions 1 to 5 inclusive, circle the correct answer.

- 1 The Periodic Table shows all known elements.

Which statement, about the elements in the Periodic Table, is true?

- A The alkali metals become more reactive as the group is descended.
- B The noble gases are more reactive than the halogens.
- C In moving from left to right across the Periodic Table, elements become more metallic.
- D The halogens become more reactive as the group is descended. [1]

- 2 Which type of wave requires a material medium for transmission?

- A microwaves
- B radio
- C sound
- D x-rays [1]

- 3 Air is a mixture of oxygen, nitrogen, carbon dioxide with traces of several other gases.

Which line in the table gives the correct composition of the three main gases in air?

	Percentage of oxygen	Percentage of carbon dioxide	Percentage of nitrogen
A	20	0.04	78
B	20	1.0	78
C	21	0.04	78
D	21	1.0	78

[1]

- 4 Fig. 4.1 shows how the total volume of oxygen gas evolved varies with time when hydrogen peroxide decomposes in the presence of the catalyst manganese(IV) oxide.

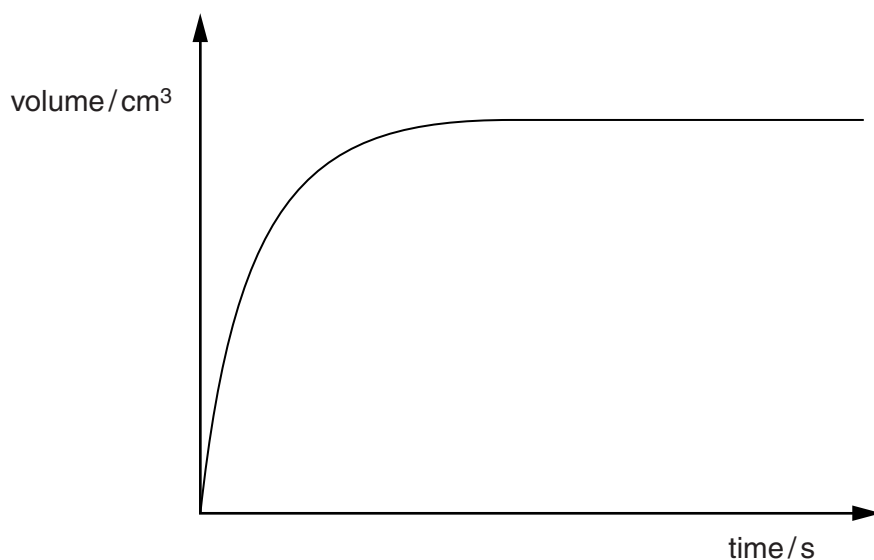


Fig. 4.1

Which of the following is the reason for the graph to have such a shape?

- A** Both hydrogen peroxide and manganese(IV) oxide are used up.
- B** The temperature falls as the reaction proceeds.
- C** The manganese(IV) oxide is used up.
- D** The hydrogen peroxide is used up.

[1]

- 5 Fig. 5.1 shows a speed – time graph for a bus travelling between two bus stations, **O** and **S**.

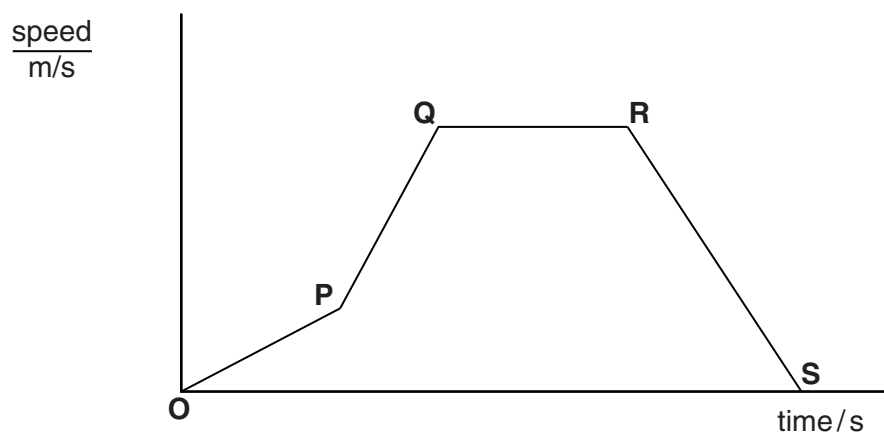


Fig. 5.1

Which section of the graph shows the bus moving with zero acceleration?

- A OP**
- B PQ**
- C QR**
- D RS**

[1]

- 6 Table 6.1 shows the melting and boiling points of five substances.

Table 6.1

Substance	Melting point / °C	Boiling point / °C
selenium	217	685
anisole	−38	154
bromine	−7	59
propane	−188	−42
cobalt	1492	2900

List the substances that are solids or liquids at room temperature (25 °C).

solid(s)

liquids[2]

- 7 Fig. 7.1 shows a 10 N force applied to a block on a frictionless horizontal surface. The block moves with an acceleration of 2 m/s^2 .



Fig. 7.1

Calculate the mass of the block.

mass =[2]

- 8 Fig. 8.1 and Fig. 8.2 show instruments used to measure volume.

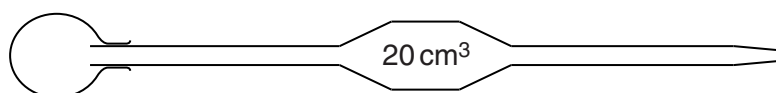


Fig. 8.1

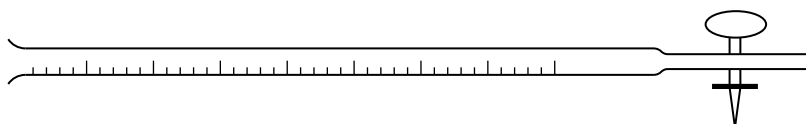


Fig. 8.2

Name these instruments.

Fig. 8.1

Fig. 8.2[2]

- 9 Fig. 9.1 shows a ray of light incident on a plane mirror.

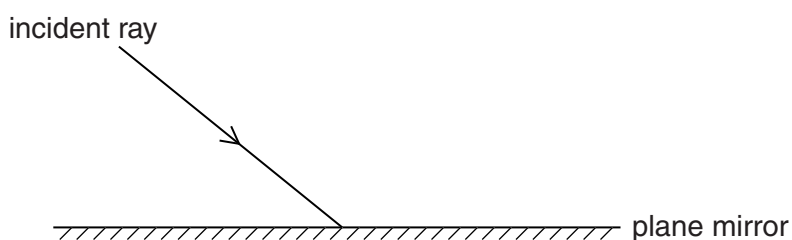


Fig. 9.1

Complete the path of the ray of light after it strikes the mirror.

[1]

- 10 Table 10.1 shows the electronic configuration of atoms **E**, **F**, **G** and **H**.

Table 10.1

Atom	Electronic configuration
E	2, 7
F	2, 8, 8
G	2, 8, 8, 2
H	2, 8, 4

- (a) Choose **two** elements from Table 10.1 that can react together to form covalent compounds.

.....[1]

- (b) Use the Periodic Table to name an element that is in the same group as **F**.

.....[1]

- (c) Write the charge of an ion of **E**.

.....[1]

- 11 A ship is stationary and sends a pulse of sound waves to the seabed.

The sea bed is 323 m below the ship.

The reflected pulse is detected 0.425 s after it was sent from the ship.

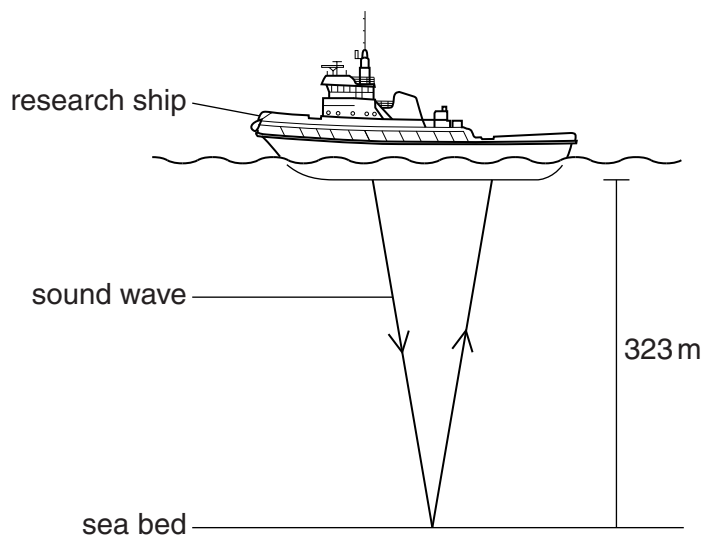


Fig. 11.1

Calculate the speed of the sound wave in the sea water.

Show your working.

speed = m/s [2]

- 12 **X**, **Y** and **Z** are all metals.

Carbon reduces the hot oxides of **X** and **Y** but not the oxide of **Z**.
X removes the oxygen from the oxide of **Y** on strong heating.

Arrange these metals in their order of reactivity.

most reactive

.....

least reactive

[2]

- 13 State the speed of radio waves in a vacuum.

.....[1]

- 14 Magnesium oxide, MgO , is reacted with dilute sulfuric acid, H_2SO_4 .
Magnesium oxide is a basic oxide.

Write down the formulae of the **products** of the reaction.

formula 1

formula 2[2]

- 15 A liquid-in-glass thermometer uses a physical property of the liquid which changes with temperature.

It is calibrated using two fixed points.

- (a) Name the physical property.

.....[1]

- (b) Name the **two** fixed points.

.....

.....[2]

- 16** Hydrogen is an element.
Water is a compound.
Air is a mixture.

(a) Describe, using these substances, the difference between an element and a compound.

.....

[1]

(b) State **two** differences between a mixture and a compound.

1

 2
[2]

- 17** Fig. 17.1 shows a circuit with a cell, a resistor and three meters, labelled **K**, **L** and **M**.

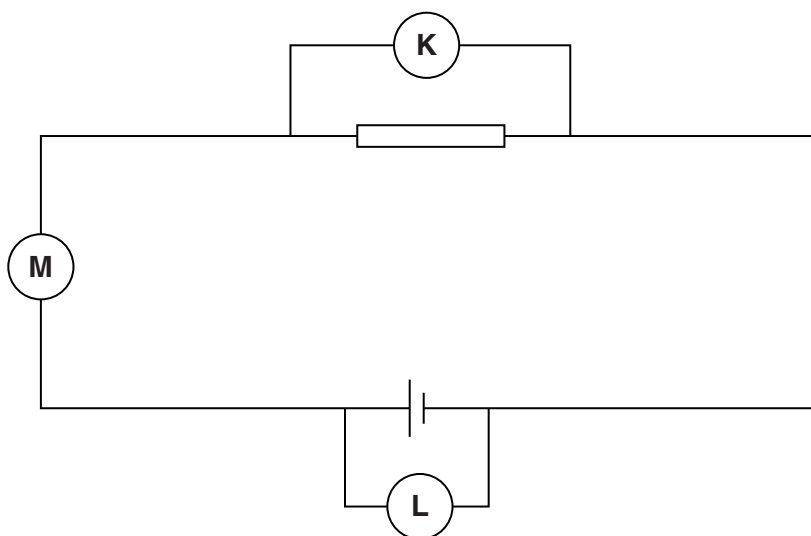


Fig. 17.1

(a) Indicate, with an arrow, the direction of the current in the circuit. [1]

(b) State which meter **K**, **L** or **M** measures the current in the circuit.

.....[1]

(c) Name the instrument used to measure electric current.

.....[1]

- 18 Name the process by which the sun produces energy.

.....[1]

- 19 The substances coal, hydrogen, petrol, methane and paraffin are fuels.

- (a) (i) Name a fuel from the list which does not pollute the environment when burnt.

.....[1]

- (ii) Explain your answer.

.....

.....[1]

- (b) Write a word equation for the combustion of methane in an adequate supply of oxygen.

.....[1]

- 20 Magnetic fields can be represented by field lines.

Fig. 20.1 shows two bar magnets.

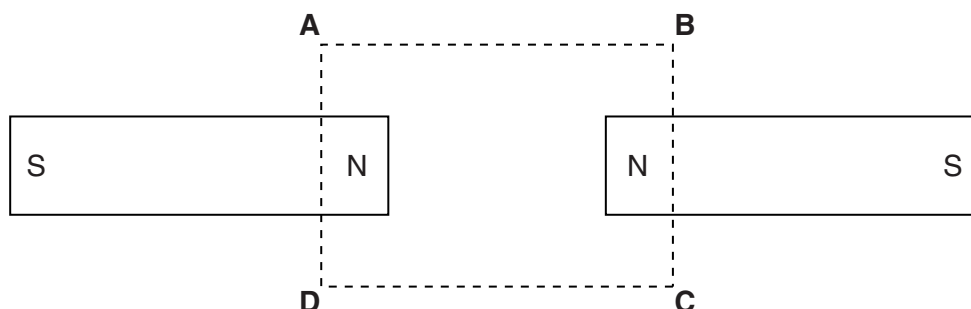


Fig. 20.1

Draw field lines to show magnetic field in this arrangement.

You only need to consider the space enclosed by the box **ABCD**.

[2]

- 21 (a) Complete the following sentence.

An alpha particle has four and has a charge.
[2]

- (b) Explain why alpha particles are deflected less than beta particles in a magnetic field.

.....

.....[1]

DATA SHEET
The Periodic Table of the Elements

Group																						
I	II											III	IV	V	VI	VII	O					
													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	98 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	186 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	209 Po Polonium 84	210 At Astatine 85	222 Rn Radon 86					
223 Fr Francium 87	226 Ra Radium 88	227 Ac Actinium 89																				