

EXAMINATIONS COUNCIL OF ZAMBIA
Joint Examination for the School Certificate
and General Certificate of Education Ordinary Level

SCIENCE
(CHEMISTRY, PHYSICS)
PAPER 1 Multiple Choice

5124/1

Tuesday

1 NOVEMBER 2011

1 hour

Additional materials:
Mathematical tables
Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (types B or HB is recommended)

Time: 1 hour

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.

Look at the left hand side of your answer sheet. Ensure that your name, the school/centre name and subject paper are **printed**. Also ensure that the subject code, paper number, centre code, your examination number and the year are **printed and shaded**. Do not change the already printed information.

There are **forty questions** in 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.

Read very carefully the instructions on the answer sheet.

INFORMATION FOR CANDIDATES

Each correct answer will score one mark. A mark will not be deducted for a wrong answer. Any rough working should be done in this booklet.

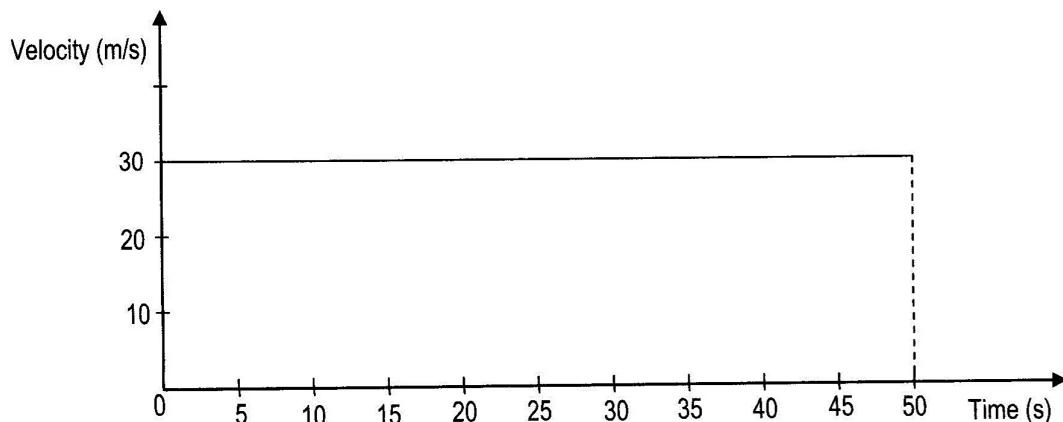
A copy of the **Periodic Table** is on page 11.

Cell phones are not allowed in the Examination Room.

- 1** Which of the following is not an S.I unit?

A m/s
B N
C °C
D W

- 2** The diagram below shows a velocity-time graph for a man who moves from village X to village Y on a bicycle.



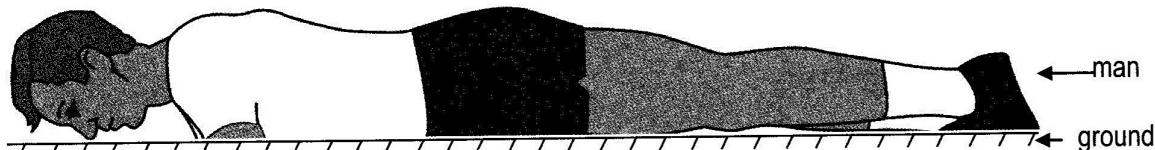
Which of the following is true? The ...

- A distance moved by the man in 50s is 30m.
B acceleration of the man in 50s is 0m/s^2 .
C acceleration of the man in 50s is 1500m/s^2 .
D final velocity of the man after 50s is 1500m/s.

- 3** What is the weight of a 500g mass on the moon where gravitational field strength is 1.6N/kg ?

- A 0.8N
B 8N
C 312.5N
D 800N

- 4** A man of mass 80kg lies on the ground as shown below.

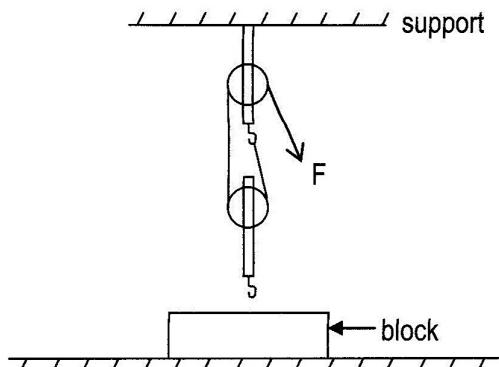


Assuming the acceleration of freefall, $g = 10\text{m/s}^2$, the gravitational potential energy of the man is ...

- A 0J.
B 8J.
C 88J.
D 800J.

- 5 A stone of mass 24g and density 2.5g/cm^3 is split into two pieces of mass 18g and 6g respectively. What is the density of the smaller piece?
- A 0.8g/cm^3
B 1.3g/cm^3
C 2.5g/cm^3
D 4.0g/cm^3

- 6 The diagram shows a pulley system being used to lift a block from the ground.



What is the velocity ratio of the pulley system?

- A 0
B 1
C 2
D 3

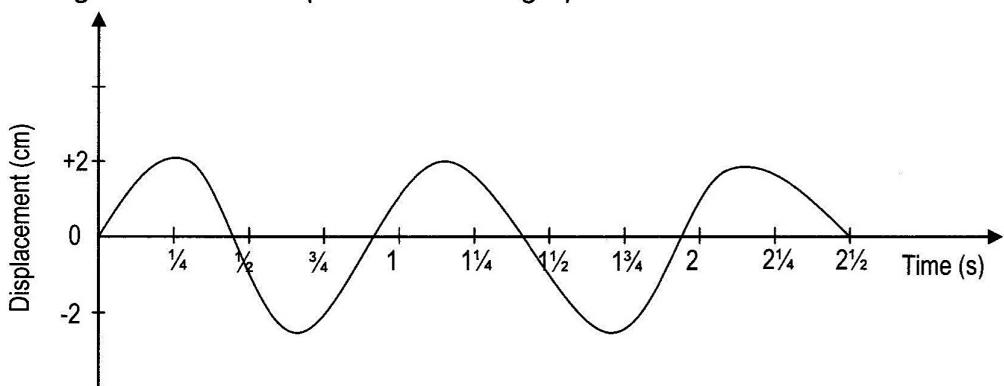
- 7 Which substance does not contract if cooled from 2°C to 0°C ?

- A Pure oil
B Pure water
C Brass
D Gold

- 8 What happens when a liquid is being heated at its boiling point? The ...

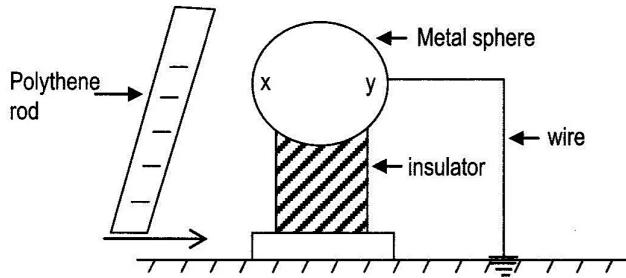
- A molecules become bigger.
B intermolecular spaces increase.
C intermolecular spaces decrease.
D number of molecules increases.

- 9 The diagram shows a displacement-time graph for a transverse wave.



How long does it take to make 2.5 waves?

- A $\frac{3}{4}$ s
 - B $1\frac{1}{2}$ s
 - C $2\frac{1}{4}$ s
 - D $2\frac{1}{2}$ s
- 10 Which statement about refraction is true? When light passes from air to glass, it ...
- A speeds up and wavelength decreases.
 - B slows down and wavelength decreases.
 - C speeds up and the frequency decreases.
 - D slows down and the frequency decreases.
- 11 In order to produce a sound wave, there should always be ...
- A a drum.
 - B vibrations.
 - C longitudinal waves.
 - D air.
- 12 The figure shows a negatively charged polythene rod moving closer to a metal sphere, which is on an insulator. There's a wire from the sphere to the ground.



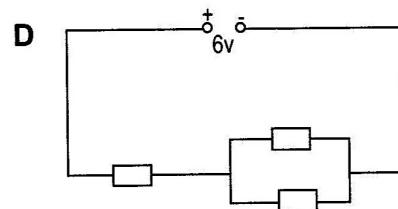
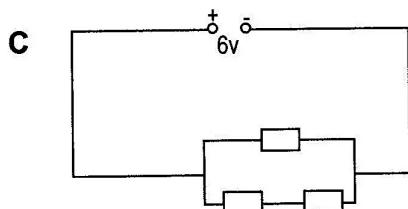
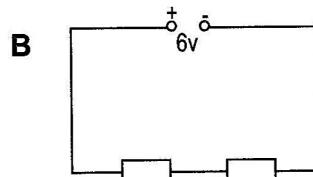
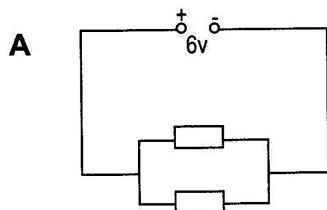
Which of the following is true?

- A Side 'x' of the sphere is charged negatively.
- B Side 'x' of the sphere receives protons from side 'y'.
- C Conventional current flows to the sphere.
- D Side 'y' of the sphere receives protons from side 'x'.

13 Which of the following quantities is expressed in the same unit as potential difference?

- A Positive charge
- B Electromotive force
- C Electric current
- D Electric power

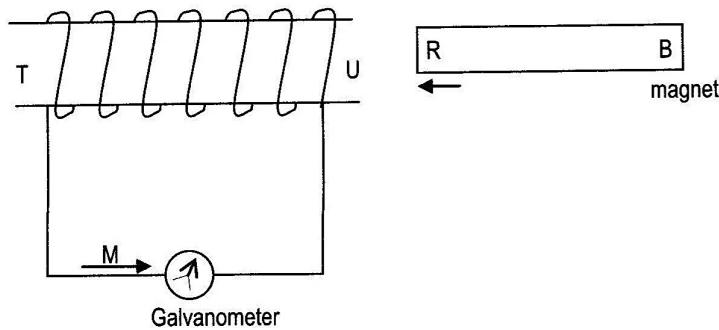
14 Which of the following circuits containing identical resistors will give the highest current?



15 The formulae used to find electrical power is ...

- A $P = IV$.
- B $P = VR$.
- C $P = VQ$.
- D $P = wt$.

16 The diagram shows a magnet moving into a solenoid.



Which of the following is true?

- A If 'R' is a south pole, the induced current flows in the direction shown by arrow 'M'.
- B If 'R' is a north pole, the induced current flows in the direction shown by arrow 'M'.
- C If 'B' is a south pole, the induced current on face T of the solenoid flows clockwise.
- D If 'B' is a north pole no current is induced in the solenoid.

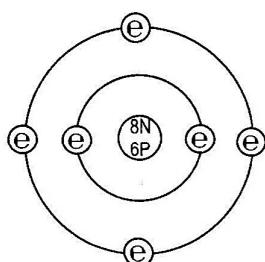
- 17 A transformer is used to convert 240V to 12V in order to power a table lamp. If the current in the primary coil is 0.2A, what is the current in the secondary coil? (Assume that the transformer is ideal)

A 0.01A
 B 0.10A
 C 0.20A
 D 4.00A

- 18 Which part of the Cathode Ray Oscilloscope helps the emitted electrons to come together to form a fine beam?

A Control grid
 B Cathode
 C Anode
 D X-plates

- 19 The diagram shows the structure of an atom of carbon.



Key

e = electron
 n = neutron
 p = proton

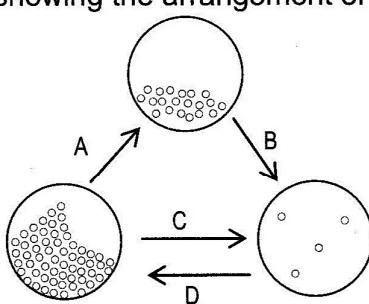
What is the nuclide notation of this atom?

A ${}^8_6\text{C}$
 B ${}^{12}_6\text{C}$
 C ${}^{14}_6\text{C}$
 D ${}^{20}_{14}\text{C}$

- 20 A radioactive substance has a mass of 100g and a half-life of 2 minutes. How much of this substance remains undecayed after 6 minutes?

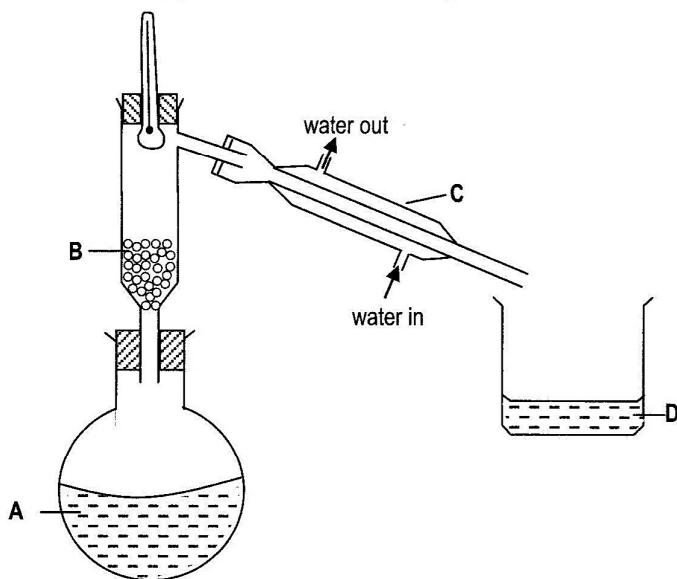
A 12.5g
 B 25g
 C 50g
 D 75.5g

- 21 Study the diagram below showing the arrangement of particles during change of state of matter.



Which process, A, B, C or D shown in the diagram does ammonium chloride undergo when heated?

- 22 The diagram below shows apparatus used to carry out fractional distillation.



Which part labelled, **A**, **B**, **C** or **D** represents a 'fraction'?

- 23 Which of the following atomic particles has almost the **same mass** as a neutron?

- A** Electron
- B** Proton
- C** Sodium ion
- D** Alpha particle

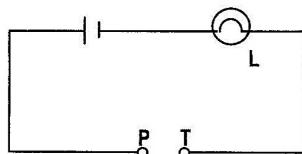
- 24 Which of the following is **not** one of the three classes of substances?

- A** Compound
- B** Neutron
- C** Element
- D** Mixture

- 25 The formula for Copper (I) Oxide is ...

- A** CuO.
- B** CuO₂.
- C** Cu₂O.
- D** 2CuO.

- 26 The diagram below shows an incomplete electrical circuit. Pieces of elements are placed in turn between **P** and **T**.

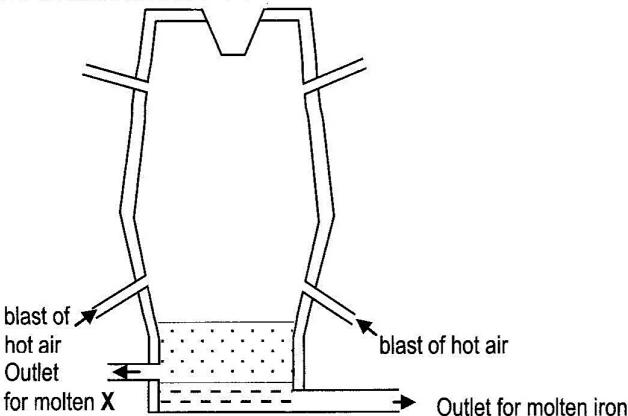


Which of the following elements would **not** cause the light bulb, **L**, to light?

- A** Boron
- B** Beryllium
- C** Lithium
- D** Scandium

- 27** How many oxygen atoms are in 1.6g of sulphur trioxide, SO₃?
- A 3
B 4.8
C 3.6×10^{22}
D 9.6×10^{23}
- 28** Acids act alike because they all contain ...
- A sulphate ions.
B hydrogen ions.
C hydroxide ions.
D cations.
- 29** A solution X formed a white precipitate with silver nitrate which was insoluble in nitric acid. What could solution X contain?
- A Silver chloride
B Sodium carbonate
C Barium nitrate
D Ammonium chloride
- 30** Slaked lime is added to liquid waste from factories in order to ...
- A protect the water.
B protect aquatic creatures.
C minimise the H⁺ ions in the water.
D minimise the OH⁻ ions in the water.
- 31** How many elements are in period 6 of the Periodic Table?
- A 8
B 10
C 18
D 32
- 32** In which of the following are the halogens correctly arranged as solid, liquid or gas?
- | | Chlorine | Iodine | Bromine |
|----------|-----------------|---------------|----------------|
| A | gas | solid | liquid |
| B | gas | liquid | solid |
| C | liquid | gas | solid |
| D | solid | gas | liquid |

- 33 The diagram shows the blast furnace used to extract iron from haematite.



When substance X is drained and solidified, it is used mostly for ...

- A road building.
 - B making electric wires.
 - C making car bodies.
 - D making water pipes.
- 34 Which of the following is **not** a physical property of metals?

- A They react with oxygen to form oxides.
- B They have high melting and boiling points.
- C They are good conductors of electricity and heat.
- D They have high densities.

- 35 The gases coming from a car's exhaust contain oxides of nitrogen. How are these oxides formed? Nitrogen reacts with ...

- A carbon dioxide.
- B carbon monoxide.
- C oxygen.
- D petrol.

- 36 When hydrogen is passed over black powder (Copper (II) oxide) the black powder turns pink. The reaction is shown in the equation below.



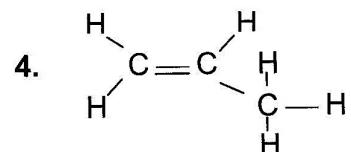
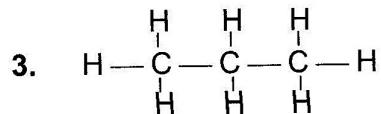
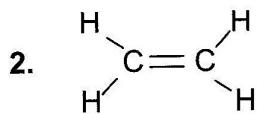
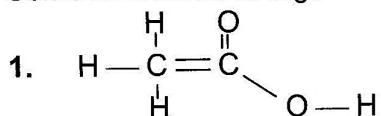
In this reaction, hydrogen is ...

- A the oxidising agent.
- B the reducing agent.
- C one of the products.
- D being reduced.

- 37 At the water works, the screen ...

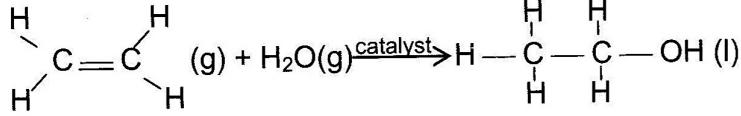
- A gets rid of the large bits of rubbish.
- B traps the larger particles of sand.
- C makes smaller particles stick together.
- D dissolves and kills any remaining bacteria.

38 Some structures of organic compounds are shown below.



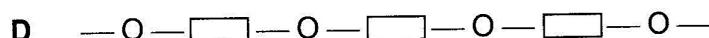
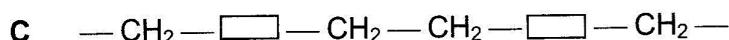
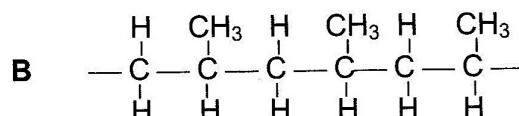
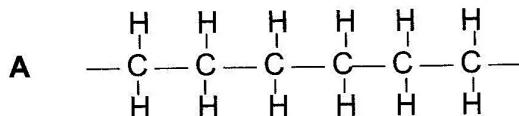
Which compound(s) decolourise bromine water?

- A 1 and 2
 - B 2 and 4
 - C 3 only
 - D 1, 2 and 3
- 39 Ethanol for use as a solvent is made from ethene and steam as shown below.



This reaction is called ...

- A polymerisation.
 - B fermentation.
 - C addition.
 - D hydrolysis.
- 40 Which of the following is the structure of polypropene?



DATA SHEET**The Periodic Table of the Elements****Group**

I	II			III	IV	V	VI	VII	0
			H 1 Hydrogen						

Li Lithium 3	B Boron 4	C Carbon 6	N Nitrogen 7	O Oxygen 8	F Fluorine 9	He Helium 2			
Na Sodium 11	Mg Magnesium 12	Sc Scandium 21	Ti Titanium 22	V Vanadium 23	Cr Chromium 24	Mn Manganese 25	Fe Iron 26	Co Cobalt 27	Ni Nickel 28

B Boron 5	C Carbon 6	N Nitrogen 7	O Oxygen 8	F Fluorine 9	Ne Neon 10
Al Aluminum 13	Si Silicon 14	P Phosphorus 15	S Sulphur 16	Cl Chlorine 17	Ar Argon 18

Ga Gallium 31	Ge Germanium 32	As Arsenic 33	Se Selenium 34	Br Bromine 35	Kr Krypton 36
In Indium 49	Sn Tin 50	Sb Antimony 51	Te Tellurium 52	I Iodine 53	Xe Xenon 54

Tl Thallium 81	Pb Lead 82	Bi Bismuth 83	Po Polonium 84	At Astatine 85	Rn Radon 86
Ce Cerium 58	Pr Praseodymium 59	Nd Neodymium 60	Pm Promethium 61	Sm Samarium 62	Eu Europium 63

Gd Gadolinium 64	Tb Terbium 65	Dy Dysprosium 66	Ho Holmium 67	Er Erbium 68	Tm Thulium 69	Yb Ytterbium 70	Lu Lutetium 71
Cm Curium 96	Bk Berkelium 97	Cf Californium 98	Es Einsteinium 99	Fm Fermium 100	Md Mendelevium 101	No Nobelium 102	Lr Lawrencium 103

*58-71 Lanthanoid series
+90-103 Actinoid series

Key

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

Group

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

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