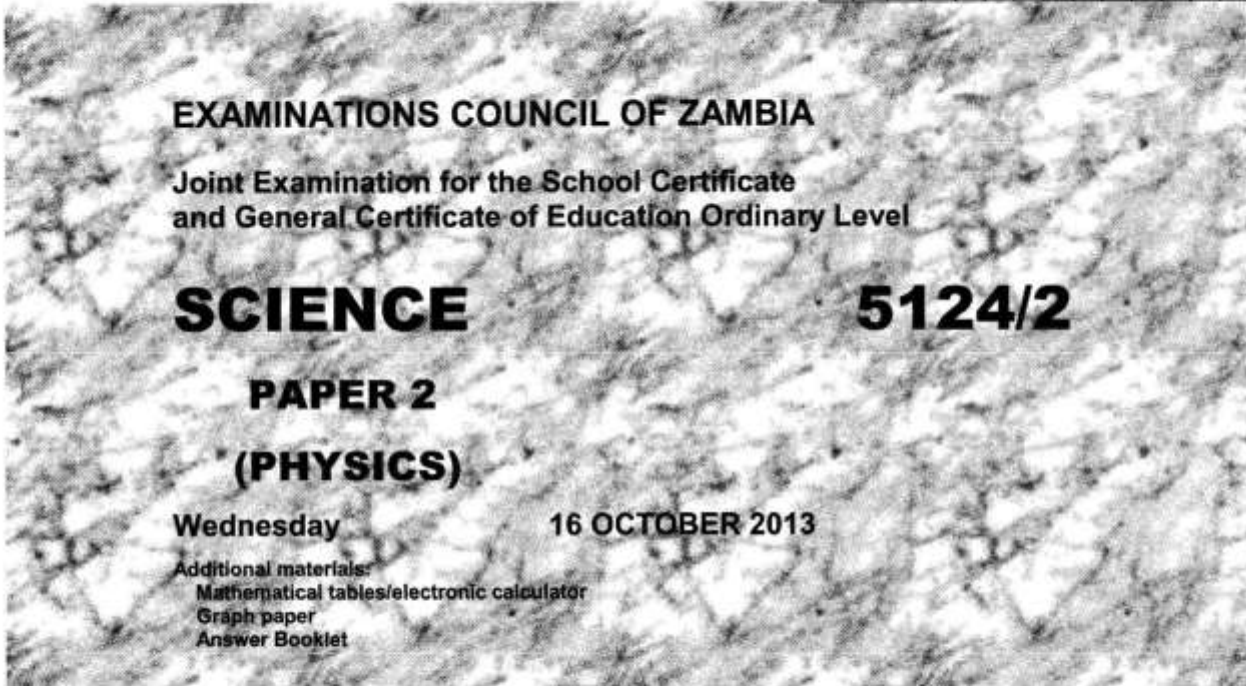


Candidate Name _____

Centre Number		Candidate Number												



Time: 1 hour 15 minutes

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number at the top of this page and on any separate Answer Booklet used.

There are **twelve (12)** questions in this paper.

Section A

Answer **all** the questions.

Write your answers in the spaces provided on the question paper.

Section B

Answer any **two** questions.

Write your answers on the Answer Booklet provided.

At the end of the examination

1. Fasten Answer Booklet used securely to the question paper.
2. Enter the numbers of the **Section B** questions you have answered in the grid shown.

INFORMATION FOR CANDIDATES

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

Cell phones are not allowed in the Examination room.

Candidate's use	Examiner's use
Section A	
Section B	
Total	

Section A

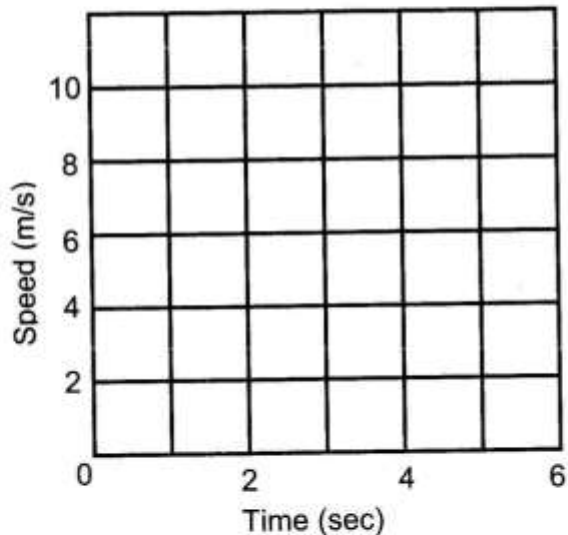
[45 marks]

Answer all questions.

Write your answers in the spaces provided on the question paper.

- 1 A car of mass 1400kg starts from rest and moves along a straight road with a constant acceleration to reach a speed of 10m/s in 6 seconds.

- (a) On the axes below, draw a graph of speed against time for the first 6 seconds of the motion.



[1]

- (b) For the motion of the car in the first 6 seconds, calculate the

- (i) distance travelled by the car

Distance = _____ [1]

- (ii) acceleration of the car

Acceleration = _____ [1]

- (iii) resultant force acting on the car.

Resultant force = _____ [1]

[Total: 4]

2 (a) State one difference between mass and weight.

_____ [1]

(b) What two factors will make an object stable?

(i) _____

(ii) _____ [2]

(c) A mass of an object is 50kg on earth, what will be its mass on the moon?

Mass on the moon = _____ [1]

[Total:4]

- 3 (a) Briefly describe how the mass of a liquid can be determined. Show how the final result can be calculated.

[3]

- (b) An empty relative density bottle has a mass of 35g. When filled with water, its mass becomes 85g.

Calculate the

- (i) mass of water

Mass of water = _____ [1]

- (ii) volume of the bottle (take the density of water to be 1g/cm^3)

Volume of bottle = _____ [2]

[Total: 6]

- 4 **Figure 4.1** below shows a door well secured on the door frame.

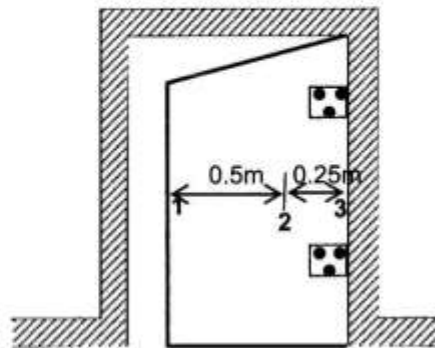


Figure 4.1

- (a) What is meant by moment of force? Include its SI unit?

[2]

- (b) Calculate the moment of force if a force of 10N is applied at point 1 to open or close the door.

Moment of force = _____ [2]

- (c) Explain why it is easier to open or close the door if the handle is fixed at point 1 than at point 2 or 3.

[2]

[Total:6]

5 **Figure 5.1** below shows a simple bottle opener made by fixing two screws into a piece of wood.

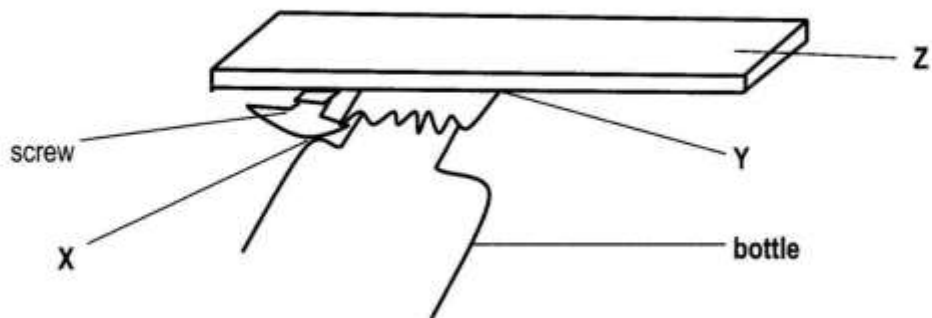


Figure 5.1

(a) What is meant by a simple machine?

[1]

(b) Which of the points **X**, **Y** or **Z** is;

(i) the pivot _____

[1]

(ii) the effort _____

[1]

(c) Is the force applied at **X** less or greater than the force applied at **Z**?

[1]

(d) State one modification that should be made on the design of the bottle opener so that less effort is used to open the bottle.

[1]

[Total: 5]

- 6 **Figure 6.1** below shows how the temperature of some liquid in a beaker changed as it was heated until it boiled.

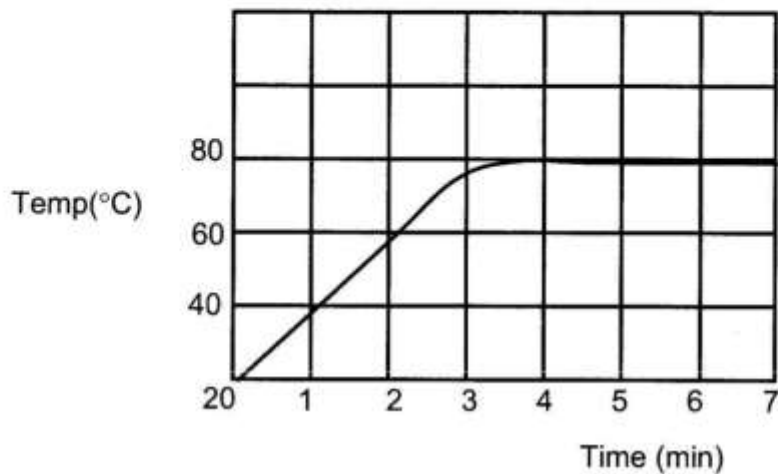


Figure 6.1

- (a) What was the boiling point of the liquid?

Boiling point = _____ [1]

- (b) State and explain what difference, if any, there would be in the final temperature if the liquid was heated more strongly.

_____ [2]

- (c) State two differences between boiling and evaporation.

_____ [2]

[Total: 5]

7 Figure 7.1 below shows an incomplete ray diagram.

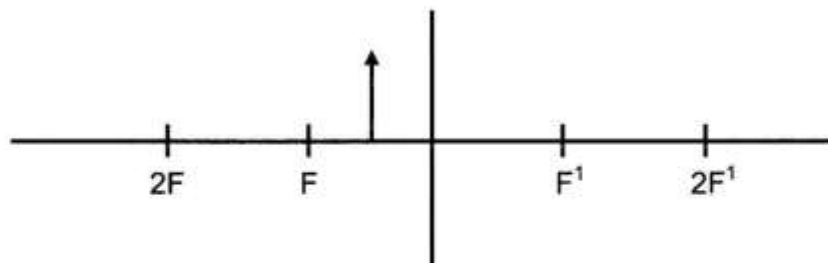


Figure 7.1

(a) Complete the ray diagram above to show the position of the image. [3]

(b) Give two characteristics of the image formed.

(i) _____

(ii) _____ [2]

[Total:5]

8 Study the circuit diagram in Figure 8.1 below.

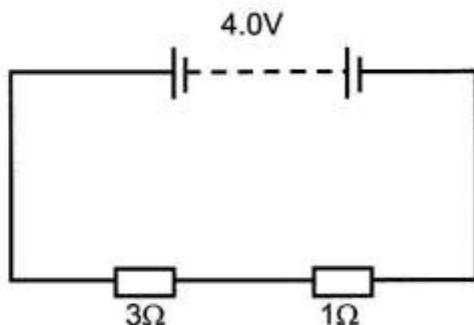


Figure 8.1

(a) Calculate the current through the battery.

Current = _____ [2]

(b) (i) How long would it take a charge of 2.0C to flow through the battery?

Time = _____ [2]

(ii) How much energy would be used in moving this charge round the circuit?

Energy = _____ [2]

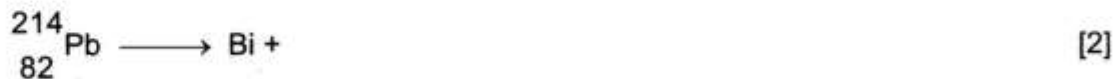
[Total:6]

9 (a) For one neutral atom of lead $\left[\begin{matrix} 214 \\ 82 \end{matrix} \text{Pb} \right]$, state the number of;

(i) Neutrons _____ [1]

(ii) Electrons _____ [1]

(b) Lead nucleus can undergo decay by the emission of beta particle to produce a bismuth (Bi) nucleus. Complete the equation below to represent the decay of the lead nucleus.



[Total: 4]

Section B

[20 marks]

Answer any **two (2)** questions from this section.Use the **Answer Booklet** provided.

- 10 (a) Describe an experiment to show that a blackened metal surface is a better absorber of infrared radiation than a polished metal surface at the same temperature. [5]

- (b) An electric light bulb quickly reaches a constant high temperature when switched on. Explain how heat is lost from the bulb and also why the temperature of the bulb becomes constant. [5]

[Total: 10]

- 11 (a) Describe an experiment to determine the upper fixed point of a liquid – in glass thermometer. [4]

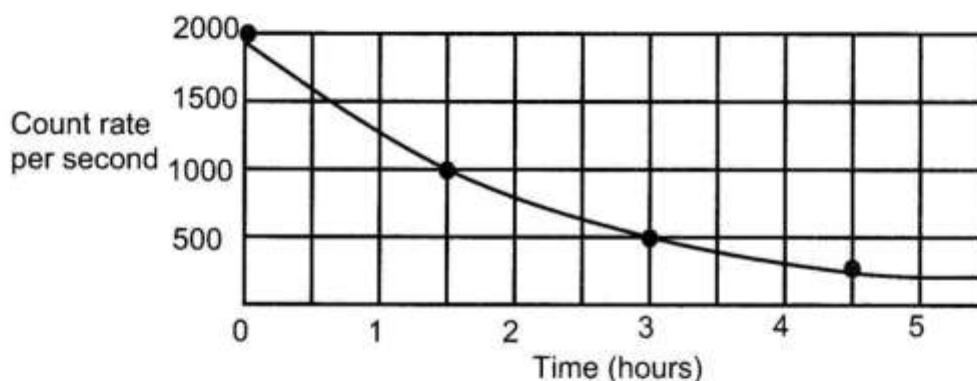
- (b) (i) The volume of a gas at a temperature of -73°C and a pressure of 380mm Hg is $1\,000\text{cm}^3$. Find the volume of the same gas at a pressure 760mm Hg and temperature of 127°C . [2]

- (ii) State two advantages of mercury over alcohol as thermometric liquids. [2]

- (c) Give two advantages of a thermocouple thermometer over liquid in glass thermometers. [2]

[Total: 10]

- 12 A detector of nuclear radiation was set up to measure the decay of a radioactive substance. **Figure 12.1** below shows the results of the experiment.

**Figure 12.1**

- (a) (i) What is the half-life of the substance? [1]
 (ii) Clearly explain how you obtained your answer to (a) (i) above. [2]
- (b) List any three properties of a beta-particle. [3]
- (c) Describe how you would show that the radioactive source is emitting only beta-particles. [4]

[Total: 10]