### **PMR EXAMINATION**

# (Form 1)

## PAPER 2

- Three test tubes, each containing a different concentration of sodium chloride solution, were prepared. Each test tube contained bead seedlings of the same age of growth. The test tube were placed in one corner of the laboratory and left for a week. Observations were made daily to see how the bean seedlings grew.
  - a) State a suitable aim for the experiment.
  - b) State a suitable hypothesis for the experiment.
  - c) Identify the following variables.
    - i. Manipulated : \_\_\_\_\_
    - ii. Controlled : \_\_\_\_\_
    - iii. Responding : \_\_\_\_\_

d) What are the materials and apparatus used in the experiment ?

2. Figure below shows two physical quantities of a cylinder being measured.



a) Name the instruments used.

A :			
В:			

- b) What are the physical quantities being measured ?
  - A : \_\_\_\_\_\_ B : \_\_\_\_\_
- c) What are the diameters measured by A and B?
  - A : \_\_\_\_\_\_ B : \_\_\_\_\_

3. Figure below shows three types of instruments.



- a) State a common characteristic found in three instruments.
- b) How is the instrument F different from D and E?
- c) Classify and name the instruments according to the graphic organizer below.



4. Figure below shows cell K and L.



- a) Name cells K and L in the spaces provided in Figure above.
- b) Q controls all cell activities . Label Q in the cell L.
- c) Based on structures R or S in cell L, complete Table below.

Name of structure	Functions of structure

5. The table below shows the densities of some substances.

Substance	Density
Cork	0.25 g <i>cm</i> <sup>-3</sup>
Glass	2.50 g <i>cm</i> <sup>-3</sup>
Chengal wood	0.93 g <i>cm</i> <sup>-3</sup>
Fire Clay brick	2.40 g <i>cm</i> <sup>-3</sup>
Iron	7.85 g <i>cm</i> <sup>-3</sup>
Nickel	8.80 g cm <sup>-3</sup>

a) State two characteristic which are common in all the substances.

b) Classify the substances according to the scheme below. (sea water has a density of 1.02 g  $cm^{-3}$ ; solid granite has a density of 2.70 g  $cm^{-3}$ )



6. The following are different types of substances.

Chlorine gas	Nitrogen gas	Coconut oil
Sea Water	20 sen coin	Iron nail
Gold bar	Sand grains	Water vapour

a) State two characteristic which are common in all the substances.

b)

Classify the substances according to the graphic organizer below :



c) Group the substances into the following types of substances :

Easily compressed substances : \_\_\_\_\_

Cannot be easily compressed substances : \_\_\_\_\_

The figure below shows a method used to separate substances.

	test	tube		
filter paper	-		R	
1	511	or	iginal mixtu	ire
1	0			
funnel	res	idue		
	8			
test tube -	0			
	10			
the combus	h filtr	ate		

a)	N ame the method used.
b)	What type of substances can be separated by using this method ?
c)	What is an important characteristic of the substance that allows it to be separated by this method ?
d)	What is the main aim of this method of separation ?
e)	State a natural resource which can be treated by using this method.

8. The following are two groups of chemical substances.

Group A	Group B
Oxygen	Gold
Sulphur	Silver
Chlorine	Iron
Hydrogen	Copper

a) State three characteristic common to all of the substances.

- b) State a term which can be used to describe all of them.
- c) Name the group A and B.
- d) Complete the table below by stating three differences between the two groups.

Group A	Group B

e) State two more example for each of the groups.

Group A : \_\_\_\_\_

Group B : \_\_\_\_\_

9. Figure below shows the apparatus used in an experiment.



- a) State a suitable hypothesis for the experiment.
- b) What can you observe at the end of the experiment ? Explain what happens.
- c) What new substance is formed inside the sodium hydroxide ? Write an equation to show the reaction.
- d) What process has occurred during the experiment ?
- e) What is the gas produced during the process ?
- f) What is the conclusion of the experiment ?

10. An experiment was carried out using a 1000ml vessel, M, and a 250 ml vessel, N. Two similar lighted candles were placed inside each vessel. A mixture of 10% oxygen and 90% nitrogen was pumped inside the larger vessel to replace the air inside. The vessel was then sealed. Pure oxygen was pumped into the second vessel and it was also sealed after that.



- a) Which candle will burn out first ? Why?
- b) What are the controlled, manipulated and responding variables in the experiment?
  - i. Controlled variable : \_\_\_\_\_
  - ii. Manipulated variable : \_\_\_\_\_\_
  - iii. Responding variable : \_\_\_\_\_\_
- c) What will happen if the gases inside M are replaced with
  - i. Carbon dioxide ?\_\_\_\_\_
  - ii. Pure oxygen ? \_\_\_\_\_\_
- d) What does the experiment show ?

11. The following are different form of energy.

Wind	Energy	Tidal Energy	Geothemal energy	Solar energy	Hydroelectric energy
a)	State tw	o common cha	racteristic in all the form	s of energy.	
b)	Name a	nother example	e of this type of energy.		
c)	What se	condary form o	of energy is produced by	these sources o	f energy ?
d)	Classify	the types of en	ergy according to the gra Types of energy	aphic organiser b	below.
	Kinetic	energy	Radiant energy		Heat energy
		Y			Y

12. The figure below shows two flasks, A and B, filled with coloured water. One flask was placed on the table while the other was placed inside a basin containing hot water. The water level rose in the glass tube connected to flask A.



- a) State a suitable hypothesis for this experiment.
- b) Identify the following variables.
  - i. Constant variable : \_\_\_\_\_
  - ii. Manipulated variable : \_\_\_\_\_
  - iii. Responding variable : \_\_\_\_\_
- c) What can you conclude from the results of the experiment ?
- d) State one application of the result.

13. The figure below shows two natural phenomena.



a) Name the two natural phenomena.

	C:
	D :
b)	At which time of the day does each of the phenomena occur ?
	C :
	D :

- c) What is the type of heat flow which causes the two phenomena?
- d) What physical properties of the land and sea make these two natural phenomena possible ?
  - (i) Land : \_\_\_\_\_\_
  - (ii) Sea : \_\_\_\_\_

14. The figure below shows a container of water containing a small crystal of potassium manganate (VII). When the container is heated, the potassium manganate (VII) dissolve in the water and rises, creating a pattern as shown in the figure.



- a) What is the aim of the experiment ?
- b) Explain the following .

(i) Why did the dissolved potassium manganate (VII) rise ?

(ii) Why did it then fall before rising again inside the water ?

c) What does the experiment tell you about the density of hot liquid and cold liquids?

(i) Hot liquids : \_\_\_\_\_\_

(ii) Cold liquids : \_\_\_\_\_

d) State three application of this phenomena In daily life.

(i)	 	 
(ii)		
(iii)		

15. Figure below shows pictures of three states of matter.



- a) On figure above label the states of matter for each picture.
- b) Based of Picture 1,2, and 3 draw diagrams to show the arrangement of the particles in each state of matter.



c) State one property to differentiate between the states of matter.

#### Answer

#### Subjective

**1. (a)** To determine the effect of different concentrations of sodium chloride solution on the growth of bean seedlings.

(b) Different concentrations of sodium chloride solution will affect the growth of bean seedlings.

- (c) (i) Concentration of sodium chloride solution
  - (ii) Types of bean seedling used; period of experiment
  - (iii) Growth of bean seedlings
- (d) Materials : Bean seedlings, sodium chloride solution Apparatus : test tubes
- 2 (a) A: internal calipers

B : external calipers

- (b) A : internal diameter of cylinderB: external diameter of cylinder
- (c) A : 2cm

B : 2.2 cm

- (d) 2.2 2.0cm = 0.2 cm
- 3. (a) There are all balance
  - (b) It is meant for determining the weight of object.
  - (c) name of instrument : balance
    - (i) quantity of measured : mass of object
    - (ii) quantity of measured : weight of object
      - D : lever balance
      - E: double beam balance
      - F: spring balance: compress springs
- 4. (a) K : animal cell
  - L : Plant cell
  - (b) Nucleus
  - (c) R : cell wall; gives the cell a fived shape
    - S : Chloroplast; contains chlorophyll for photosynthesis

5.(a) (Any 2 of the following answers)

They are all different type of matter ;

They have mass;

They occupy space

- (b) Example of denser than solid granite : Iron, NickelExample of float in sea water : cork, chengal wood,Example of sink in sea water : glass, fire clay brick
- (c) Metals : Iron, nickelNon metals : cork, chengal wood, glass, fire clay brick
- 6 (a) (Any 2 of the following answers)

They are all different states of matter They have mass They occupy space

- (b) Example of gases : Chlorine gas, Nitrogen gas, water vapour
  Example of liquid : sea water, coconut oil
  Example of solids : 20 sen coin, iron nail, gold bar, sand grains
- (c) Easily compressed : chlorine gas, nitrogen gas, water vapour

Cannot easily to compressed : sea water, coconut oil , 20 sen coin, iron nail, gold bar, sand grains

- 7 (a) Filtration
  - (b) Mixtures

(c) The components of the mixture are just physically mixed but not combined chemically to forn any compound

- (d) to purify substance
- (e) raw water
- 8 (a) they are the simplest forms of a substance

They cannot be broken down into any simpler substance by chemical or physical means They contain only one type of particle of the substance

- (b) There are elements
- (c) A : non metals
  - B : metals
- (d)

Group A	Group B
Have low melting and boiling points	Have higher melting and boiling points
Are ductile or malleable	Not ductile or malleable
Shiny and can be polished	Dull, cannot be polished

(e) Group A : boron, argon

Group B : nickel, magnesium

9. (a) The snail gives out carbon dioxide during respiration

(b) The sodium hydroxide will rise the test tube. This is because the carbon dioxide produced will dissolve in the sodium hydroxide solution.

- (c) Sodium carbonate
- (d) respiration
- (e) carbon dioxide
- (f) carbon dioxide is produced by the snail

10. (a) M, even though the container is bigger, it contains less oxygen. In fact it contains only 100ml oxygen as compared to N which contains 250ml of pure oxygen.

- (b) (i) The type of candle used
  - (ii) The gas mixture used, the two vessels of different volume.
  - (iii) Rate of combustion of the two candles
- (c)(i) the flame of the candle extinguishes immediately
  - (ii) its candle will burn longer than the candle in N.
- (d) oxygen is required for the candle to burn or combustion

- 11. (a) there are renewable sources of energy
  - There are non polluting sources of energy
  - (b) biomass energy
  - (c) electricity
  - (d) Example of kinetic energy : wind energy, tidal energy, hydroelectric energy

Example of radiant energy : solar energy

Example of heat energy : geothermal energy

- 12. (a) water expands when heated
  - (b) (i) the same type of flask used
    - (ii) different temperature for A and B
    - (iii) increase in water's volume causing the water level to rise in the tube
- (c) water expands when heated
- (d) use of liquids e.g : mercury and alcohol, in the thermometer

13. (a) C : land breeze

- D : sea breeze
- (b) C : night
  - D : day
- (c) heat convection
- (d) (i) heats up faster than the sea during the day; losses heat faster during the night
  - (ii) heats up slower than the land during the day; loses heat slower during the night

14. (a) To study the transfer of heat by convection

(b) (i) When the dissolved potassium manganate (VII) is heated, its particle receive more energy and move faster and further apart (expands). Its expansion makes it less dense and it moves upwards. Its space is the taken over by the denser cooler liquid below it.

(ii) As the liquid rises to the top it becomes cooler and therefore less dense. It then sinks to the bottom to be heated again and repeat the cycle.

(c) (i) Less dense

(ii) denser

- (d) (i) Ventilation of buildings
  - (ii) Electric kettle
  - (iii) refrigerator

15. (a) Picture 1 : solid

Picture 2 : liquid

Picture 3 : Gas

(b) the arrangement of particle in matter OR the movement of particle in matter.