



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

**SEKHUKHUNE DISTRICT
PHYSICAL SCIENCES CONTROL TEST 2
GRADE 10 TIME 1 ½ hrs MARKS 100 DATE: 22-09-2016**

INSTRUCTIONS AND INFORMATION

1. Answer all questions.
2. Non-programmable calculations may be used.
3. You may use appropriate mathematical instruments.
4. Number the questions correctly according to the number system used in this question paper.
5. Data sheet and periodic table will be provided by your school.
6. Wherever motivations, discussions, et cetera are required, be brief.
7. Show ALL formulae and substitutions in ALL calculations.
8. Round off your FINAL numerical answers to a minimum of TWO decimal places.
9. Write neatly and legibly.

QUESTION 1

Four options are provided as possible answers to the following questions. Each question has any one correct answer. Write only the letter (A-D) next to the question number (1.1 – 1.10) in the answer book.

1.1 Which of the following statements about distance, displacement and speed is correct?

	Distance	Displacement	Speed
A	Scalar	Scalar	Scalar
B	Scalar	Vector	scalar
C	Vector	Vector	scalar
D	Vector	Vector	Vector

(2)

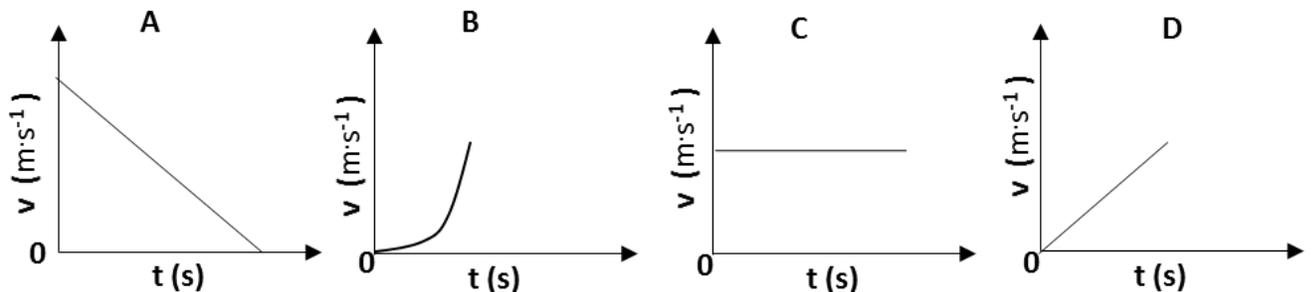
1.2 If a car accelerates at $3\text{m}\cdot\text{s}^{-2}$, that means

- A. Every 3 seconds the car travels 1m further
- B. Every second the car travels 3m less
- C. Every second the car travels 3m faster
- D. Every second the car travels $3\text{m}\cdot\text{s}^{-1}$ faster

(2)

1.3 Which of the following velocity-time graphs is correct for an object moving at constant velocity?

(2)



1.4 The expression " $\frac{1}{2}a\Delta t^2$ " has units of.....

- A. s
- B. $\text{m}\cdot\text{s}^{-2}$
- C. m
- D. $\text{m}\cdot\text{s}^{-1}$

(2)

1.5 Avogadro's number indicates the number of particles in one...

- A. Mole of a substance
- B. Atomic mass unit of a substance
- C. Formula unit of a substance
- D. Gram of a substance

(2)

1.6 The process whereby ions become surrounded with water molecules in a water solution is called.....

- A. Electrolysis
- B. Hydration
- C. Dissolution
- D. Ionization

(2)

1.7 Which one of the following salts is soluble in water ?

- A. $\text{Ba}(\text{NO}_3)_2$
- B. BaSO_4
- C. BaCO_3
- D. PbSO_4

(2)

1.8 The concentration of a solution can be determined by the formula....

- A. $c = m/M$
- B. $c = V/n$
- C. $c = nV$
- D. $c = m/MV$

(2)

1.9 When aqueous solutions of an acid and base are mixed

- A. No reaction occurs
- B. A new acid and a new base are formed
- C. A salt and water are formed
- D. An acid and a salt are formed

(2)

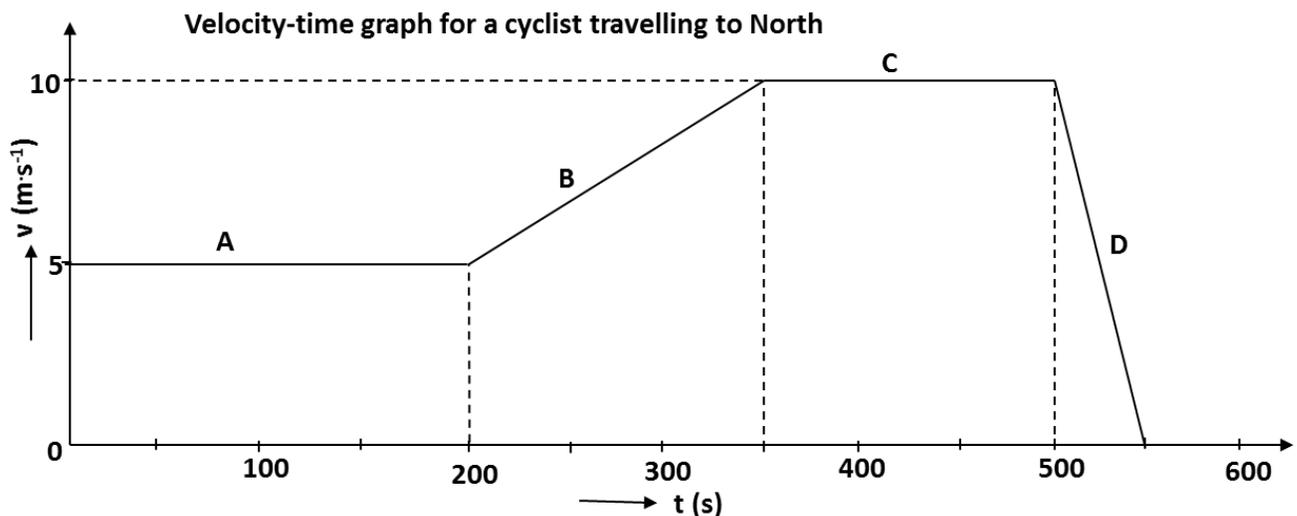
10. Potassium Sulphate solution in water is able to conduct electricity because the solution.....

- A. Contains water
- B. Has free electrons
- C. Has ions that are free to move
- D. Contains potassium metal

(2)
[20]

QUESTIONS 2

The graph given below shows motion of a cyclist towards North during a bicycle journey. The graph is not according to scale. There are four stages for the graph namely A, B, C and D.



2.1 Which are the stages showing constant speed? Give reason for your answer. (2)

2.2 What is the:

2.2.1 initial velocity of the cyclist? (1)

2.2.2 speed of the cyclist after he accelerated for 150s (1)

- 2.3 Stages B and D shows acceleration. Explain why we say there is acceleration during these two stages. (2)
- 2.4 Does the cyclist speed up more quickly than slowly down? Explain your answer. (3)
- 2.5 Calculate the cyclist's acceleration during stages B using the graph. (do not use equations of motion) (5)
- 2.6 Use your answer in 2.5 and calculate the distance travelled by the cyclist during stage B. (use only equations of motion) (5)
- 2.7 Use the graph to calculate the distance covered by the cyclist during the first 200s of his journey (4)
- [23]**

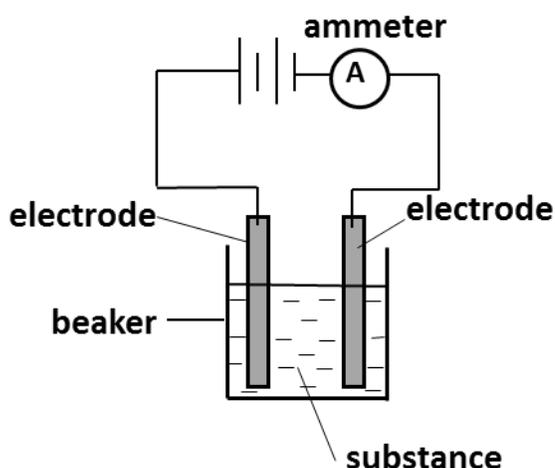
QUESTION 3

3.1 When ionic substances are dissolved in water or when they are molten, the solution (liquid) is able to conduct electricity. What is the name given to such solutions or liquids? (2)

3.2 Mention 3 factors that affect the conductivity of a solution. (3)

3.3 Grade 10 learners performed an experiment according to the set up below.

They took different substances in the beaker and the ammeter reading (current) was recorded.



Results are recorded on the table below.

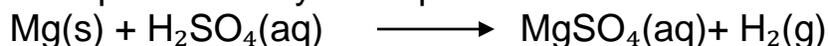
No	Substance taken in beaker	Ammeter reading
1	Distilled water	No current recorded
2	Tap water	Current recorded
3	Sea water	Current recorded
4	Alcohol	No current recorded
5	Oil	No current recorded
6	Brine	Current recorded

- 3.3.1 What is the aim of the experiment (2)
- 3.3.2 Mention the independent variable of the experiment (2)
- 3.3.3 What is the dependent variable? (2)
- 3.3.4 Why the Ammeter recorded readings when test substance brine was used but when test substance oil was used, there is no reading recorded? (4)
- 3.4 Determine the empirical formula of a compound containing 43.40% Na; 11.32%C and 45.28%O. (8)
- 3.5 Tap water contains Chloride ions as Chlorine is used to treat water. "It is alleged that some companies fill tap water that contains Chloride ions in plastic bottles and sell it as distilled water."
If you are given such a bottle of water, which is suspected of having Chloride ions, how will you test for the presence of Chloride ions? (3)

[26]

QUESTION 4

4.1 The reaction between magnesium and dilute Sulphuric acid (H_2SO_4) is represented by the equation:



During experiment, 2.0 g of magnesium reacts with excess dilute Sulphuric acid to produce hydrogen gas at STP

Calculate:

- 4.1.1 Mass (in grams) of hydrogen gas produced (5)
4.1.2 Number of hydrogen atoms in the mass as calculated in 4.1.1 above (5)

- 4.2 When heated, 0.280g of blue hydrated copper Sulphate, $\text{CuSO}_4 \times \text{H}_2\text{O}$, gave 0.1789g of colourless anhydrous, CuSO_4 .
4.2.1. What is meant by “water of crystallization”? (2)
4.2.2. Calculate the number of moles water of crystallization (x) in the compound. And find the molecular formula of hydrous copper sulphate (6)

[18]

QUESTION 5

To prepare an aqueous solution of known concentration of a salt, one needs to know the mass of salt and a volume of the solution.

If a 250 cm³ solution of Sodium Sulphate (Na_2SO_4) with a concentration 0.5mol·dm⁻³ has to be prepared,

5.1 Calculate:-

- 5.1.1 the molar mass of sodium sulphate (2)
5.1.2 the number of moles of Sodium Sulphate in solution (3)
5.1.3 the mass (in grams) of Sodium Sulphate required to prepare this solution. (2)
5.2 By mistake somebody added 100 cm³ distilled water to the solution (250 cm³ solution of Sodium Sulphate with a concentration 0.5mol·dm⁻³) that you have made. What will be the concentration of the solution after adding distilled water? (3)
5.3 When $\text{Na}_2\text{SO}_{4(s)}$ is dissolved in water, the solid ionic crystal breaks up into ions. Write a balanced equation for this breaking of solid into ions. (3)

[13]

TOTAL = 100