**MARK SCHEME**

**ANESTAR SCHOOLS**

**CHEMISTRY**

**FORM TWO**

**TERM 1 YEAR 2020**

**Answer all the questions in the spaces provided.**

1. How many atoms of each element are present in each of the following compounds:

 (a) Ammonium carbonate – **N = 2, H = 8, C = 1 O = 3** (2 mks)

 (b) Zinc chloride - **Zn = 1, Cl = 2**  (2 mks)

2. The table below shows some elements in the periodic table. Use it to answer questions that

 follow. The letters are not the actual symbols of the elements.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| P |  |  |  |  |  | Q | R |
|  |  |  |  |  | **S** | **T** |  |
| V | **K** |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

 (a) An element K has an atomic number of 20. Indicate its position in the grid. (1 mk)

 **Group II period 4**

 (b) Write the formula of the compound formed between V and S. (1 mk)

 **V2S**

 (c) Which element belongs to period 2 and group VIII? (1 mk)

 **R**

 (d) Write the electron configuration of: (3 mks)

 (i) P – **2.1**

 (ii) Q – **2.7**

 (iii) S – **2.8.6**

(e) Using cross (x) or a dot (•) diagram to represent electrons, draw;

 (i) Atomic structure of V. (2 mks)

 

 (ii) Ionic structure of T. (2 mks)



3. Determine the relative atomic mass of the following elements whose isotopic compositions

 occur in the proportions given:

 (a) Argon

 36Ar (0.34%), 38Ar(0.06% and 40Ar(99.6%) (2 mks)

 18 18  18

**(36 x 0.34) + (38 x 0.06) + (40 x 99.6) = 39.99**

 **100**

(b) Potassium40K(0.01%) , 39**K** (93.1%) and 41K(6.89%) (2 mks)

 19 19 19

 **(40 x 0.01) + (39 x 93.1) + (41 x 6.89) = 39.14**

 **100**

4. The following table gives a summary of some properties of elements PQR and S. T he letters

 do not represent the actual symbols of the elements. Study the table and answer the questions

 that follow.

|  |  |  |
| --- | --- | --- |
| **Element** | **Electron arrangement** | **Valency** |
| P | 2.2 | 2 |
| Q | 2.7 | 1 |
| R | 2.8.2. | 2 |
| S | 2.8.8.2 | 1 |

 (a) Which two elements have similar chemical properties? Explain. (2 mks)

 **P,R,S – Any two**

 **They both lose two electrons/Both in group (II)**

 (b) What is the most likely formula of a carbonate of S? (1 mk)

 **SCO3**

 (c) (i) Identify the element which is a non-metal. (1 mk)

 **Q**

 (ii) With an explanation, state the family and the period to which the element in (ii)

 above belongs. (2 mks)

  **Group – VII – Seven electrons in the outermost energy level**

 **Period – 2 – Two energy levels.**

5. Name the elements present in the following compounds.

 (i) Zinc sulphide – **Zinc, Sulphur** (2 mks)

 (ii) Sodium nitrate - **Sodium, Nitrogen and oxygen** (2 mks)

6. The figure below shows a type of the flame produced by a bunsen burner. (3 mks)

 (a) Name the parts of the flame labeled A, B and C. (3 mks)

 **A – Pale-blue**

 **B – Green blue**

 **C – Almost colourless**

 (b) Name the type of the flame. (1 mk)

 **Non-luminous flame**

 (c) Which of the parts in the above flame is the hottest? (1 mk)

 **Part A (pale blue zone)**

7. Explain why most of the apparatus in the laboratory are made of glass. (2 mks)

 **- Easy visibility for monitoring the reactions**

 **- Easy to clean**

 **- Does not react with chemicals**

8. Solutions may be classified as strong base, neutral, strong acid, weak base or weak acid. The

 information below gives some solutions and their pH values. Study it and answer the

 questions that follow.

|  |  |
| --- | --- |
| **Solution** | **pH** |
| A | 0.5 |
| B | 7 |
| C | 14 |
| D | 9 |

 Classify the solutions in the table using the stated classification: (2 mks)

 **A – Strong acid**

 **B – Neutral**

 **C – Strong base**

 **D – Weak base**

9. Below is a set up used to investigate the reaction of calcium with water.



 (a) State the observation made in solution. (1 mk)

 **- Pubbles produced**

 **- Colourless gas colleds at the top**

 (b) Identify gas C and state its test. (2 mks)

 **- Hydrogen gas**

 **- Extinguishes a burning splint**

 (c) (i) Write a balanced equation for the reaction between calcium and water. (2 mks)

 **Ca(s) + 2H2O(l) Ca(OH)2(aq) + H2(g)**

 (ii) State the effect of the solution in C(i) on phenolphthalein indicator. (1 mk)

 **Pink**

 (iii) State one laboratory application of the solution formed in the reaction. (1 mk)

 **Used to taste the process of carbon(iv) oxide.**

10. (a) Name the particles that are found in an atom. (1 mk)

 **- Electrons**

 **- Protons**

 **- Neutrons**

 (b) Atoms are said to be electrically neutral. Explain. (2 mks)

 **The number of protons (+ve charges) equals the number of electrons (-ve) charges)**

 **hence –ve and +ve balance out.**

 (c) Distinguish between:

 Atomic number and atomic mass. (2 mks)

 **Atomic number - Number of protons at the nucleus of an atom.**

 **Atomic mass – Sum of protons and neutrons in the nucleus of an atom.**