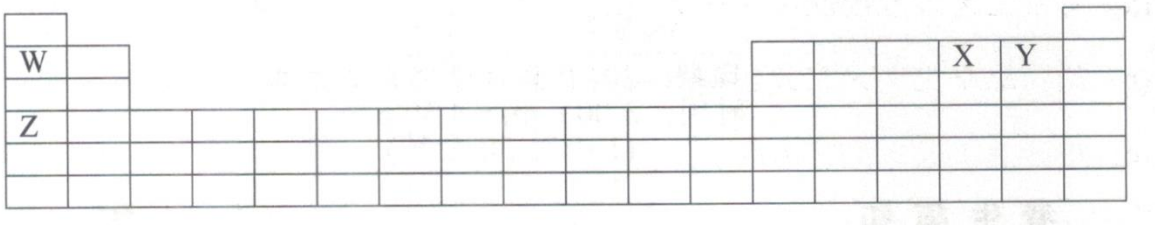
# 2022 Senior 1 Revision Exercise Paper 2

1. Element W, X, Y and Z is located in the Periodic Table of Elements as below:




   a. Arrange W, X, Y and Z in increasing order:
      i. Atomic radius
      ii. Ionisation energy
   b. Compare the following pairs and explain:
      i. Size of W and its ion
      ii. Size of X and its ion

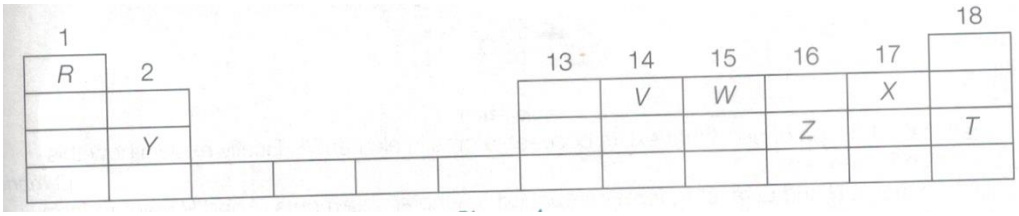
2. The following is some information about compound W.
   - Contains carbon, hydrogen and oxygen
   - 0.04 mol W contains 0.96 g carbon and o.24 g hydrogen
   - Relative molecular mass of W = 62.0

   a. Define empirical formula
   b. Using the information given,
      i. Calculate the mass of oxygen in 0.04 mol W.
      ii. Determine the empirical formula of W.

      [Relative atomic mass: H = 1.0; C = 12.0; O = 16.0]

      iii. Determine the molecular formula of W.
   c. What can you say about one molecule of W by referring to your answers in (b)(iii)?

3. Diagram below shows a part of the Periodic Table of Elements. The letters R, V, W, X, Y, Z and T are not the actual symbols of the elements.




   a. State the type of chemical bond found in the compound formed between R and X.
   b. State ab ion formed by element Y.
   c. Can element T form a compound? Explain your answer.
   d. W exists as diatomic molecules. Write the Lewis structure of this diatomic molecule.
   e. Predict the formula of a compound formed between V and Z.

4. Table below shows the proton numbers, nucleon numbers and the number of neutrons of several elements.

| Elements | Proton number | Nucleon number | Number of neutrons |
|---|---|---|---|
| P | 6 | 12 | 6 |
| Q | 7 | 14 | |
| R | 6 | | 7 |
| S | 8 | 16 | 8 |
| T | 5 | 11 | 6 |

   a. Complete Table 3.
   b. Write the arrangements of electrons of Q and S.
   c. What is the number of electrons of R and T?
   d. What is the number of valence electrons of P?
   e. i) Determine the isotope pairs from Table 3.

      ii) Give a reason for your answer in (f)(i).

5. The following is the chemical equation of a redox reaction

   $Zn + Pb(NO_3)_2 \text{ ----> } Zn(NO_3)_2 + Pb$

   a. Write half equation for the oxidation and reduction reactions.
   b. Identify substance that is oxidised and reduced. Explain your answer in terms of electron transfer.