The modern periodic table – *Mark scheme*

1. (a) (i) argon **and** potassium **or** tellurium **and** iodine **or** cobalt **and** nickel   1

         *accept correct symbols; allow argon **and** calcium*

     (ii) it would place them in incorrect <u>groups</u> (owtte)   1

         *idea of <u>not</u> being placed with elements which have similar properties **or** converse argument*

         accept would not have same number of electrons in outer shell allow it would put them in wrong period if linked to argon and potassium / calcium

         *do **not** accept reasons based just on protons*
         *do **not** accept metals and non-metals mixed up*

   (b) any **two** from: 2

- each successive atom has one more electron

- atoms in the same group have the same number of electrons in their <u>outer</u> shells / energy levels

         number of electrons in outer shell = group number

- across a period an energy level / shell is being filled

- in the next period the next energy level / shell is being filled

         accept period number = shell number

[4]

2. (a) 6 **or** 16   **or** transition metal or F block element or actinide   1

   (b) (elements in group 6 have) six (electrons) in the outer shell or needs 2 electrons to gain a full shell   1

         accept has 98 electrons

[2]

3. (a) He   1

   (b) carbon / silicon / germanium / tin / lead   1

         accept correctly written symbols: C / Si / Ge / Sn / Pb

   (c) copper   *accept Cu*   1

   (d) iodine   accept I or I_2 1

[4]

4. (a) 2 and 3   *both needed*   1

   (b) (i) atomic number / proton number   1

         electrons neutral

     (ii) argon has more neutrons   1

         accept more particles in nucleus

     (iii) increases   1

         by one with each element   1

[5]