Chemical families

1. a) - Non- metallic group
    - Ionic radius larger than atomic radius
    b) X – has smallest atomic radius hence more electronegative
2. To prevent filament from burning out. Provides an atmosphere in which burning cannot occur
    i.e. inert atmosphere
3. a) Halogens
    (b) X & Y
    (c) Z is the largest atom with the highest number of energy levels occupied by electrons.
    The longer an atom is the higher the forces of attraction that hold the molecules of the
    element together
    (d) $3Z_{(g)} + 2Fe_{(s)} \longrightarrow FeZ_{3(s)}$
    (e) The blue litmus paper turned red that bleached. This is because it dissolves in water to form\
    an acid and bleaching solution of HO^{-1}
4. (i) Down the group an extra energy level is added
    (ii) In group x elements form ions by ionizing the outer energy levels
    (iii) A cross the period an extra proton is added which increased he nuclear attraction force
    (iv) BF_2
    (v) – Ionic /electrovalent
    - Involves loosing & gaining of electrons
    (vi) G, F,E
    -E has smallest atomic radius hence protons can attract an electron easier than in G
5. R – has the smallest atomic $\checkmark$ ½ size hence its outermost electrons are more strongly held to the
    nucleus resulting in high $\checkmark$ ½ value of ionization energy
6. - Add dilute nitric acid to lead (u) carbonate
    $PbCO_3(s) + 2HNO_3(aq) \longrightarrow Pb(NO_3)_2(aq) + CO_2(g) + H_2O(l)$ $^{\checkmark 1}$
    - React the resulting solution with solution of sodium sulphate i.e
    $Na_2SO_4(aq) + PB(NO_3)_2(aq) \longrightarrow PbSO_4(s) + 2NaNO_3(aq)$ $^{\checkmark ½}$
    - Filter to obtain lead (u) sulphate as residue. $^{\checkmark ½}$
    - Dry the salt of lead (u) sulphate in between the filter papers or in sunshine. $^{\checkmark ½]}$

7. a) Is one of the atoms of the same element having a different mass number from the rest,
    but same atomic number with others of the same element

    b) $\underline{92.2 \ X \ 28} + \underline{4.7 \ X \ 29} + \underline{3.1 \ X \ 30} \qquad = 28.11 \checkmark ½$
    $\quad 100 \checkmark ½ \quad 100 \checkmark ½ \quad 100 \checkmark ½$

8. a) Alkaline earth metals $\checkmark 1$
    b) P has the smallest atomic radius due to electrons of P are closest to the nucleus $\checkmark 1$
    c) $Q_{(S)} + 2H_2O_{(L)} \longrightarrow Q(OH)_{2(aq)} + H_{2(g)}$