Suggested Answers on Note (Chapter 4) P.4

Group I

Lithium	$_{3}$Li
Sodium	$_{11}$Na
Potassium	$_{19}$K
Rubidium	$_{37}$Rb
Caesium	$_{55}$Cs
*Francium	$_{87}$Fr

Reactivity,
Size of atom
(Increase / ~~decrease~~)

Melting and Boiling point,
(~~Increase~~ / decrease)

Suggested Answers on Note (Chapter 4) P.6

Group II

Beryllium	$_{4}$Be
Magnesium	$_{12}$Mg
Calcium	$_{20}$Ca
Strontium	$_{38}$Sr
Barium	$_{56}$Ba
*Radium	$_{88}$Ra

Reactivity,
Size of atom
(Increase / ~~decrease~~)

Melting and Boiling point,
(~~Increases~~ / decrease)

Suggested Answers on Note (Chapter 4) P.7

- **Melting and Boiling point (~~increase~~ / decrease)**
- **Reactivity and the size of atom (increase / ~~decrease~~)**

Group I	Group II
Li	Be
Na	Mg
K	Ca
Rb	Sr
Cs	Ba
Fr	Ra

- **Melting and Boiling point (increase / ~~decrease~~)**
- **Reactivity and the size of atom (~~increase~~ / decrease)**

Suggested Answers on Note (Chapter 4) P.9

Group VII

Fluorine	$_{9}F$
Chlorine	$_{17}Cl$
Bromine	$_{35}Br$
Iodine	$_{53}I$
*Astatine	$_{85}At$

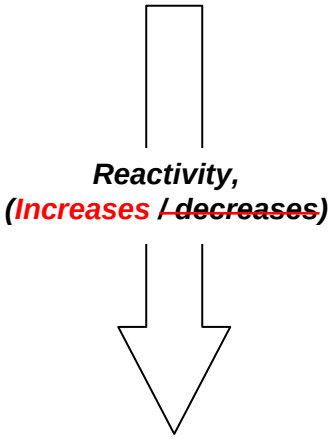
Reactivity,
(~~Increases~~ / decreases)

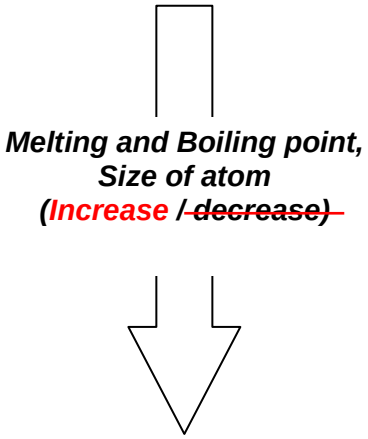
Melting and Boiling point, Size of atom
(Increase / ~~decrease~~)

Suggested Answers on Note (Chapter 4) P.11

Group O

Helium	$_{2}$He
Neon	$_{10}$Ne
Argon	$_{18}$Ar
Krypton	$_{36}$Kr
Xenon	$_{54}$Xe
*Radon	$_{86}$Rn





Summary of the trends in Group I, II, VII and O

Properties	Down the following group			
	Group I	Group II	Group VII	Group O
Melting point / Boiling point	↓	↓	↑	↑
Size of atom	↑	↑	↑	↑
Reactivity	↑	↑	↓	↑

Suggested Answers on Note (Chapter 4) P.14 – 18

1. (a) Group I
   (b) All are soft metals.
   (c) Lithium would float on water, producing gas steadily.
   (d) Potassium would melt to a silvery ball which moves about very quickly on the water surface, producing a hissing sound, burning spontaneously with a lilac flame before finally disappearing completely.
   (e) It would give a 'pop' sound.
   (f) She should not do that experiment because the reaction between caesium and water is explosive.

2. (a) Halogens
   (b) They are reactive and poisonous.
   (c) Fluorine
   (d) Fluorine
   (e) 2,7
   (f) His approach was undesirable as all halogens are poisonous.

Suggested Answers on Note (Chapter 4) P.16 – 17

1. *No. of electron in the 1st shell* = **2**
   No. of electron in the 2nd shell = **8**
   No. of electron in the 3rd shell = **6**
   Electronic arrangement = **2, 8, 6**
   Atomic number of sulphur = **total no. of electrons in sulphur atom = 16**

2. *Electronic arrangement* = **2, 8, 8, 1**
   M is **potassium (as M is located in Group I and Period 4 of the Periodic Table)**

3. (a) 2, 8, 2
   (b) 2 + 8 + 2 = 12
   (c) Magnesium
   (d) Physical property: At room temperature and pressure, X is a silvery white solid after polished or freshly cut / X has a low density.
   Chemical property: X reacts with water steadily to form alkali and hydrogen gas / X reacts with many non-metals to form salts.

4. (a) (i) Group 0. Noble gas.
   (ii) Group II. Alkaline earth metals.
   (iii) Group VII. Halogens.
   (b) (i) c, k, p.
   (ii) r, s
   (c) Hydrogen.
   (d) (i) Period 3, Group 5.
   (ii) 2, 8, 5.

Suggested Answers on Note (Chapter 4) P.18 – 19

1. *No. of electron in the outermost shell* = **1**
   Group No. = **5**
   *Reactivity (**increases** / decreases) down the group.*
   *It may react with water (slowly / vigorously / **explosively**).*

2. (a) Period 6, Group VII
   (b) Solid. Yes.
   (c) Bromine reacts with sodium metal faster than astatine does.

3. (a) There is one outermost shell electron in a caesium atom.
   This is because caesium belongs to Group I of the Periodic Table.
   (b) Caesium is a solid at room temperature and pressure.
   (c) Caesium would react explosively with cold water.
   (d) Caesium is more reactive as the reactivity of Group I elements increases down the group.
   (e) It should be stored in paraffin oil.

Suggested Answers on Note (Chapter 4) P.21 – 25

1. (a) Across a period, the elements show a gradual change (increase) in non-metallic character.
Across a period, the elements show a gradual change (decrease) in atomic size. any one

(b) Boron / silicon

(c) (i) Their atoms have different number of occupied electron shells.
(ii) Their atoms have the same number of outermost shell electrons.

(d) Both of them react with water vigorously.
Hydrogen and an alkaline solution are formed in both cases.

(e) The balloon will fall because the density of krypton is higher than that of air.

(f) The electronic arrangement of an atom of Y is 2,8,6. Hence Y belongs to Group VI of the periodic table.

2. (a)

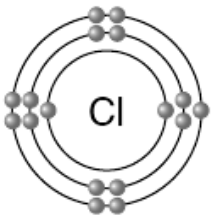
Element	State at room temperature and pressure	Colour
Chlorine	**gas**	**greenish yellow**
Bromine	**liquid**	**reddish brown**
Iodine	**solid**	**black**

(b) Halogens

(c) Their atoms have the same number of outermost shell electrons.

(d) Decreases

(e)



3. (a) Noble gases

   (b) Each noble gas atom has an octet structure (or a duplet structure) in its outermost shell.

   (c) Argon does not react with the metal filaments in light bulbs.

   (d) In advertising signs

4. (a)

Metals	**f, h**
Metalloids	**a, g**
Non-metals	**b, c, d, e**

   (b) 2

   (c) f

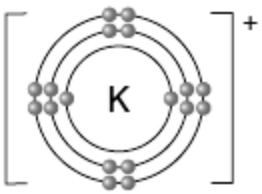
   (d) c

   (e) Alkali metals

   (f) e

5. (a) Alkali metals

   (b)



   (c) Its melting / boiling point is relatively low when compared with other metals.

   (d) (i) Rubidium is more reactive than potassium.

   (ii) Store rubidium in paraffin oil.

   (iii)
   - Use a safety screen during experiment.
   - Wear safety glasses.
   - Wear protective gloves.

6. (a) Alkaline earth metals

   (b) p = 2 q = 8 r = 2

   (c) Solid

   (d) C.
   The reactivity of alkaline earth metals increases down the group.