Classification of Substances

Solution 1.a:

The properties of substances are determined depending on their atomic number and atomic structure.

Solution 1.b:

	Compounds	**Mixtures**
1.	A compound is formed by two or more elements combined in a fixed proportion by weight.	A mixture is formed by two or more substances mixed in any proportion.
2.	The proportion of constituent elements is fixed in a compound.	The proportion of constituent substances is not fixed.
3.	The compound has properties different from those of its constituents.	The constituents of a mixture retain their properties in the mixture.
4.	Chemical processes are used to separate original constituents from the compound.	Physical properties are used to separate substances from their mixtures.

Solution 1.c:

An alloy is a mixture of two metals or metals and non-metals. In an alloy, two or more elements are mixed to change the properties of the combining metals (or metal and non-metal). There is no chemical reaction between the two combining elements. Therefore, an alloy is a mixture.

Solution 1.d:

All substances have different properties. Therefore, the classification of substances on the basis of their properties makes their study easy and convenient.

Solution 2:

- In a compound, the **constituent elements** do not retain their properties.
- In a **mixture**, properties of constituents are retained.
- The chemical symbol of calcium is **Ca**.
- The molecular formula for carbon dioxide is **CO_2**.
- The compound sodium chloride is made from the combination the elements **sodium** and **chlorine**.

- In the compounds H_2O, NaOH, H_2O_2, **hydrogen and oxygen** are the common elements.

Solution 3:

	Compound	**Number of atoms of constituent elements**	**Formula**
(a)	Potassium hydroxide	K:1, O:1, H:1	KOH
(b)	Hydrogen peroxide	H:2, O:2	H2O2
(c)	Iron chloride	Fe: 1, Cl: 2	FeCl2
(d)	Ammonium chloride	N:1, H:4, Cl:1	NH4Cl
(e)	Copper sulphate	Cu:1, S:1, O:4	CuSO4
(f)	Magnesium oxide	Mg:1, O:1	MgO

Solution 4:

Group 'A'	**Group 'B'**
(a) Sodium	3. Na
(b) Potassium	4. K
(c) Iron sulphide	2. FeS
(d) Sugar	5. C12H22O11
(e) Magnesium oxide	1. MgO