NCERT ANNEXURE

Here are some subjective type questions and answers for your reference:

1. Give reason for the need of classification of elements.

Ans. The continuous discovery of new elements and their compounds led to confusions. It became difficult to study, remember, and recall the properties of all the elements. Thus, the classification of elements was needed to make the study of elements easier and systematic.

2. What are the achievements of Mendeleev's periodic table?

Ans. **1.** Elements with similar properties were grouped together which made their study easier.
2. He predicted the existence of some other elements and left gaps for the elements to be discovered. These elements could be easily placed in the periodic table after their discovery.
3. Noble gases which were not discovered at that time could be placed separately without disturbing the table.

3. Define atomic radius of an element. Why does it vary along the period and group?

Ans. The distance between the centre of the nucleus and the outermost shell of an isolated atom of an element is called its atomic radius.
Variation along the period: - The atomic radius decreases as we move left to right along the period. This is due to an increase in nuclear charge which tends to pull the electrons closer to the nucleus and reduces the size of the atom.
Variation along the group: - The atomic radius increases down the group. This is because new shells are being added as we go down the group. This increases the distance between the outermost shell electrons and the nucleus so that the atomic size increases in spite of the increase in nuclear charge.

4. a) Atomic number is considered to be a more appropriate parameter than atomic mass for classification of elements in a periodic table. Why?
b) Chemical reactivity of alkali metals increases while that of halogens decreases as we move from top to bottom in the group. Why?

Ans. a) The properties of an element mainly depend upon its valence shell electronic configuration which, in turn depends upon the number of electrons, that can be calculated by its atomic number. Therefore, atomic number is a more appropriate parameter than atomic mass for classification of elements in a periodic table.
b) Chemical reactivity of metals depends upon their tendency to lose electrons. Due to increase in atomic size on moving down the group, the tendency to lose electrons increases as the effective nuclear charge on outermost electrons decreases, therefore the chemical reactivity of metals increases down the group.
Chemical reactivity of non-metals or halogens depends upon their tendency to gain or accept electrons. Due to increase in atomic size on moving down the group, the tendency to accept electrons decreases, therefore, the reactivity of halogens decreases as we move from top to bottom in a group.

5. "Hydrogen occupies a unique position in modern periodic table". Justify the statement.

Ans. Hydrogen occupies a unique position in the modern periodic table due to following reasons: -
a) **Similarity with alkali metals:** Both hydrogen and alkali metals have similar electronic configuration with one electron in the outermost shell. Some of the properties of hydrogen are similar to alkali metals and hence it can be placed in group I.
b) **Similarity with halogens:** Hydrogen has outer electronic configuration similar to halogens with one electron less than the nearest inert gas configuration. Therefore it resembles halogens in some of the properties and hence it can be placed in group 17 along with halogens.
c) **Unique properties:** In some properties, it differs from both halogens and alkali metals.
For example: It forms neutral oxide (H_2O), neither acidic like halogens nor basic like alkali metals.

NCERT EXEMPLAR

Here are objective type questions and answers:

1. Upto which element, the Law of Octaves was found to be applicable

(a) Oxygen (b) Calcium (c) Cobalt (d) Potassium

Ans: (B)

2. According to Mendeleev's Periodic Law, the elements were arranged in the periodic table in the order of

(a) Increasing atomic number (b) Decreasing atomic number
(c) Increasing atomic masses (d) Decreasing atomic masses

Ans: (C)

3. In Mendeleev's Periodic Table, gaps were left for the elements to be discovered later. Which of the following elements found a place in the periodic table later

(a) Germanium (b) Chlorine (c) Oxygen (d) Silicon

Ans: (A)

4. Which of the following statements about the Modern Periodic Table is correct:

(a) It has 18 horizontal rows known as Periods
(b) It has 7 vertical columns known as Periods
(c) It has 18 vertical columns known as Groups
(d) It has 7 horizontal rows known as Groups

Ans: (C)

5. Which of the given elements A, B, C, D and E with atomic number 2, 3, 7, 10 and 30 respectively belong to the same period?

(a) A, B, C (b) B, C, D (c) A, D, E (d) B, D, E

Ans: (B)