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Std 10 (English)

Science And Technology - I

Date 27-09-20

Time 1HRS

Chapter 2.00

Marks 20

Q.1 Multiple Choice Questions

1

- 1 Mendeleev's periodic table was organized on the basis of following properties.
- Only physical properties
 - Only chemical properties
 - Both physical and chemical properties
 - None of the above

Ans Option c.**Q.2 Find the odd one out**

1

- 1 Cal/g, cal/g°C, kcal/kg.°C, erg/g.°C

Ans Cal/g [(Others are units) of specific heat capacity.]**Q.3 Match the pair**

1

1	Column "A"	Column "B"
	i. Elements with atomic number 19	a. Group 18
	ii. Element Q in period 3 which has the highest electron affinity	b. Group 1
		c. Group 17
		d. Group 13

Ans	i. Elements with atomic number 19	Group 1
	ii. Element Q in period 3 which has the highest electron affinity	Group 17

Q.4 State True or False

1

- 1 The number of shells in the elements of third period is three.

Ans The number of shells in the elements of third period is three - **True****Q.5 Name the following**

1

- 1 Give the name and symbol of elements which occupy following positions in periodic table :
Period 3 Group 14

Ans Silicon (Si)**Q.6 Give scientific reasons**

4

- 1 The third period contains only eight elements even though the electron capacity of the third shell is 18.

Ans i. According of the law of electron octet, The last shell cannot have more than eight electrons.
Hence, the third period contains only eight elements in the third shell even though the electron
ii. capacity of the third shell is 18.

- 2 Metallic properties of the elements change to non metallic properties as one moves from left to right in a

period of periodic table.

- Ans**
- i. If an element donates its valence electrons with ease so as to form positively charged ions, it is said to be metallic element.
 - ii. Conversely, if an element accepts electrons in its valence shell so as to form negatively charged ions, the element is said to be non metallic.
 - iii. On progressing from left to right, there is gradual increase in the nuclear charge due to increase in atomic number but this results in decrease in atomic size.
 - iv. Increased nuclear charge bounds the electrons in the valence shell more tightly and makes it difficult for atoms of elements to donate electrons.
- Thus the character of elements gradually changes from metallic to non metallic.

Q.7 Write Short Notes

4

- 1** Write short note on Mendeleev's periodic law.

- Ans**
- i. Mendeleev organized the period table on the basis of the chemical and physical properties of the elements.
 - ii. For this purpose, he considered the molecular formulae of hydrides and oxides of the elements, melting points, boiling points and densities of the elements and their hydrides and oxides.
 - iii. When he arranged the 63 elements known at that time in the increasing order of their atomic masses, he found that the chemical and physical properties of elements showed repetition after certain fixed interval.
 - iv. On the basis of this finding, he stated that 'properties of elements are a periodic function of their atomic masses'. This is known as Mendeleev's periodic law.

- 2** Write short note on structure of the modern periodic table.

- Ans**
- i. The modern periodic table consists of seven horizontal rows called the periods and eighteen vertical columns called the groups.
 - ii. The arrangement of the periods and groups results in the formation of boxes, where each box corresponds to the position of an element.
 - iii. In addition to these seven rows, lanthanide and actinide series are shown separately at the bottom of the periodic table. The first row is lanthanide series and the second row is actinide series.
 - iv. The entire periodic table is divided into four blocks: s-block, p-block, d-block and f-block.
 - v. A zig-zag line is drawn in the p-block of the periodic table. Metals lie on the left side while nonmetals lie on the right side of this line. Metalloids lie along the border of this line.

Q.8 Give examples

2

- 1** Give example : 3 Alkaline Earth metals and state their groups.

Ans Beryllium, Magnesium, Calcium Group 2

Q.9 Answer the following in detail (Any One)

5

- 1** Atomic number of few elements are given below 10, 20, 7, 14
- i. Identify The Elements
 - ii. Identify The Group Number
 - iii. Identify The Period
 - iv. State Their Electronic Configuration
 - v. Determine The Valency of These Elements

- Ans**
- i. 10 - Neon
 - 20 - Calcium
 - 7 - Nitrogen

14 -Silicon

- ii. Neon - Group 18
Calcium - Group 2
Nitrogen -Group 15
Silicon - Group 14
- iii. Neon - Period 2
Calcium - Period 4
Nitrogen -Period 2
Silicon - Period 3
- iv. Neon - 2, 8
Calcium - 2, 8, 8, 2
Nitrogen -2, 5
Silicon - 2, 8, 4
- v. Neon O Valency
Calcium 2
Nitrogen 3
Silicon 4

2 An element has its electron configuration as 2,8,2. Now answer the following questions.

- i. What is the atomic number of this element?
- ii. What is the valency of this element?
- iii. What is the group of this element?
- iv. To which period does this element belong?
- v. With which of the following elements would this element resemble?(Atomic numbers are given in the brackets)
N(7), Be(4), Ar(18), Cl(17)

Ans i. Atomic number 12

- ii. Valency 2
- iii. Group 2
- iv. Period 3

The element would resemble (Chemically similar) beryllium (Be) with electronic configuration (2, 2).

- v. As both possess same number of valence electrons, both would lie in the same group and display similar chemical properties.