QB365 Question Bank Software Study Materials

Periodic Classification of Elements Important 2,3 & 5 Marks Questions With Answers (Book Back and Creative)

9th Standard

Science

Total Marks : 74

2 Marks

10 x 2 = 20

1) State modern periodic law.

Answer : Modern periodic law states that "The Chemical and Physical properties of elements are the periodic functions of their atomic number".

2) What are p-block elements?

Answer : The last electron in these elements is filled in p subshells and hence these elements are called p-block elements. These elements are in group 13 to 18 in the periodic table.

3) What are alloys?

Answer : Alloys are mixtures of two or more metals and are formed by mixing molten metals thoroughly. Rarely nonmetals are also mixed with metals to produce alloys.

4) What are metalloids? Give examples

Answer : Elements which have the properties of both metals and non-metals are called as metalloids. (eg) Boron, Arsenic.

5) What are the metallic properties shown by the non-metal graphite?

Answer : Graphite has high melting point and it is a good conductor of electricity like metals

6) State Newlands' Law of Octaves

Answer : Every eighth element had properties similar to those of the first element like the eighth note in an octave of music is similar to the first.

7) Group 3-12 elements in the modern periodic table are called d-block elements.

Answer : The elements of group 3 to 12 have their valence electrons in their outermost d subshells. These elements are called d block elements.

8) What is amalgam?

Answer : When metal is alloyed with mercury it is called amalgam.

9) What are the composition of magnalium alloy?

Answer : Magnalium alloy consists of aluminium and magnesium. It is used to produce kitchen ware.

10) What are the composition of Gun metal alloy?

Answer : Gun metal alloy consist copper, Tin and Zinc. It is used as Guns and Frames of spectacles.

3 Marks

8 x 3 = 24

11) What are groups and periods in the modern periodic table?

Answer : In modern periodic table the horizontal rows are called periods. There are seven periods in the periodic table. Vertical columns starting from top to bottom are called groups. There are Eighteen groups in the periodic table.

12) What are the limitations of Mendeleev's periodic table?

Answer : (i) Elements with large difference in properties were included in the same group.

Eg: Hard metals like copper (Cu) and silver (Ag) were included along with soft metals like sodium (Na) and potassium (K).

(ii) No proper position could be given to the element hydrogen. Non-metallic hydrogen was placed along with metals like lithium (Li), sodium (Na) and potassium (K).

(iii) The increasing order of atomic mass was not strictly followed throughout.

Eg: Co & Ni, Te & I.

(iv) No place for isotopes in the periodic table.

13) Give one example of triads table?

Answer : In the triad group arithmetic mean of atomic masses of 1^{st} and 3^{rd} elements.

(6.9 + 39.1)/2 = 2. So the atomic mass of Na middle element is 23.

1^{st} element Li its mass 6.9.

3^{rd} element K its mass 39.1

So the average is 23. Hence the middle element is Na.

14) Give two limitations of Newlands table.

Answer : There are instances of two elements being fitted into the same slot. eg. cobalt and nickel. The law of octaves was not valid for elements that had atomic masses higher than that of calcium.

15) List out the uses of rare gases.

Answer : 1. Helium is used for filling weather balloon

2. Neon gas is used in discharge lamps for orange colour.

3. Argon gas is filled in electrical bulbs.

4. Radon is a radio active gas.

16) Give the electronic configuration of Argon, krypton?

Answer : Electronic configuration of Argon is 2, 8 , 8.

Electronic configuration of krypton is 2, 8, 18, 8.

17) Give the categories of metal and its examples.

Answer : (i) Alkali metal eg: Sodium, pottasium

(ii) Alkaline earth metal eg: Calcium, magnesium

(iii) Transition metals eg: Iron, Nickel.

(iv) Other metals eg: Aluminium, Tin.

18) Define monel.

Answer : 1. Monel is an alloy of nickel (67%) and copper with small amount of iron, manganese, carbon and silicon.

2. lt is stronger than pure Nickel.

3. It is extremely resistant to corrosion even in sea water.

4. It is used in aircraft construction and skins of experimental rocket planes

5 Marks 6 x 5 = 30

19) State any five features of modern periodic table.

Answer : Features of modern periodic table:

(i) All the elements are arranged in the increasing order of their atomic number.

(ii) The horizontal rows are called periods. There are seven periods in the periodic table.

(iii) The elements are placed in periods based on the number of shells in their atoms.

(iv) Vertical columns in the periodic table starting from top to bottom are called groups. There are 18 groups in the periodic table.

(v) Based on the physical and chemical properties of elements, they are grouped into various families.

20) Compare the chemicals properties of metals and non-metals.

Answer :

S.No.	Chemical property	Metals	Non-metals
1.	Electro Positive Electro Negative	Electro Positive. Metals lose electrons and form cation Eg:Na$\rightarrow$ + Na^+ + e^- Al $\rightarrow$+ AP^+ + $3e^-$	Electro Negative. Nonmetals gain electrons and form anion CI + $e^-\rightarrow$+ C O+$2e^-\rightarrow$+ $O2^-$
2	Reaction with oxygen	Metals burn with Oxygen to form metal oxides. Generally, these metal oxides are basic	Non-metals when heated with oxygen produce covalent oxides. Most of the non-metal oxides are acidic in nature
	Reaction with water a) Cold water	a) Metals like sodium and potassium react with cold water to liberate hydrogen gas	a) Carbon reacts with water to form carbon monoxide and hydrogen.
	b) Steam	b) Metals like magnesium and iron react with steam to form their respective oxides and hydrogen ii) Aluminium reacts slowly with steam to form aluminium hydroxide and hydrogen. Note: Copper, Nickel, Silver and Gold do not react with water.	Non-metals are less reactive with steam.
4.	Reaction with Acids	Metals such as sodium magnesium, aluminium react with dilute hydrochloric acid to give their respective salts	Generally, nonmetals do not react with acids, but when heated with con. HNO_3 or con H_2SO_4, the respective oxides or oxyacids are formed
5.	Reaction with Halogens	Metals react with halogen to form ionic halides	Non-metals react with halogens to form covalent halides.
6.	Oxidation/Reduction	Metals get oxidized (lose electron) on reaction with non-metals.	Non-metals get reduced (gain electron) on reaction with metals

21) List the advantages of alloys.

Answer : (i) Alloys do not get corroded or get corroded to very less extent.

(ii) They are harder and stronger than pure metals (Example: Gold is mixed with copper and it is harder than pure gold)

(iii) They have less conductance than pure metals (Example: Copper is good conductor of heat and electricity whereas brass and bronze are not good conductors)

(iv) Some alloys have lower melting point than pure metals (Example: Solder is an alloy of lead and tin which has lower melting point than each of the metals)

(v) When metal is alloyed with mercury, it is called amalgam.

22) Write the advantages of Modern Periodic Table.

Answer : (i) The table is based on a more fundamental property i.e., atomic number.

(ii) It correlates the position of the element with its electronic configuration more clearly.

(iii) The completion of each period is more logical. In a period, as the atomic number increases, the energy shells are gradually filled up until an inert gas configuration is reached.

(iv) It is easy to remember and reproduce.

(v) Each group is an independent group and the idea of subgroups has been discarded.

(vi) One position for all isotopes of an element is justified, since the isotopes have the same atomic number.

(vii) The position of the eighth group (in Mendeleev's table) is also justified in this table. All transition elements have been brought in the middle as the properties of transition elements are intermediate between left portion and right portion elements of the periodic table.

(viii) The table completely separates metals from nonmetals. The nonmetals are present in upper right corners of the periodic table.

(ix) The positions of certain elements which were earlier misfit (interchanged) in the Mendeleev's periodic table are now justified because it is based on atomic number of the elements.

(x) Justification has been offered for placing lanthanides and actinides at the bottom of the periodic table.

23) Explain the position of hydrogen in the periodic table.

Answer : Hydrogen is the lightest, smallest and first element of the periodic table. Its electronic configuration (1s) is the simplest of all the elements. It occupies a unique position in the periodic table. It behaves like alkali metals as well as halogens in its properties. In the periodic table, it is placed at the top of the alkali metals.

(i) Hydrogen can lose its one electron to form a hydrogen ion (H+) like alkali metals.

(ii) It can also gain one electron to form the hydride ion (H-) like halogens.

(iii) Alkali metals are solids while hydrogen is a gas.

Hence the position of hydrogen in the modern periodic table is still under debate as the properties of hydrogen are unique.

24) Classify the groups in modern periodic table.

Answer :

Group	**Families**
1	Alkali metals
2	Alkaline earth metals
3 to 12	Transition metals
13	Boron Family
14	Carbon Family
15	Nitrogen Family
16	Oxygen Family (or) Chalcogen family
17	Halogens
18	Noble gases