



CHEMISTRY

BOOKS - ZEN CHEMISTRY (KANNADA ENGLISH)

PERIODIC CLASSIFICATION OF ELEMENTS

Activity 5 1

1. Looking at its resemblance to alkali metals and the halogen family, try to assign hydrogen a correct position in Mendeleev's Periodic Table. To which group and period should hydrogen be assigned?



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Activity 5 2

1. Consider the isotopes of chlorine, Cl- 35 and Cl-37. would you place them in different slots because their atomic masses are different ? Or would you place them in the same position because their chemical properties are the same?



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Activity 5 3 I

1. How were the positions of cobalt and nickel resolved in the Modern Periodic Table?



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Activity 5 3 li

1. Is it possible to have an element with atomic number 1.5 placed between hydrogen and helium?



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Activity 5 3 Iii

1. Where do you think should hydrogen be placed in the Modern Periodic Table?



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Activity 5 4 I

1. Look at group 1 of the Modern Periodic Table, and name the elements present in it.



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Activity 5 4 li

1. Write down the electronic configuration of the first three elements of group I



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Activity 5 4 iii

1. What similarity do you find in their electronic configurations of Li , Na , K ?



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Activity 5 4 iv

1. How many valence electrons are present in these three elements Li , Na , K ?



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Activity 5 5 I

1. If you look at the long form of the Periodic Table, you will find that the elements Li, Be, B, C, N, O, F, and Ne are present in the second period. Write down their electronic configuration .



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Activity 5 5 li

1. Do these elements also contain the same number of valence electrons Li , Na , Mg ?



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Activity 5 6 I

1. How do you calculate the valency of an element from its electronic configuration?



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Activity 5 6 li

1. What is the valency of magnesium with atomic number 12 and sulphur with atomic number 16?



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Activity 5 6 lii

1. Find out the valencies of the first twenty elements .



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Activity 5 6 Iv

1. How does the valency vary in a period on going from left to right?



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Activity 5 6 V

1. How does the valency vary in going down a group?



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Activity 5 7 I

1. Atomic radii of the elements of the second period are given below:



Arrange them in decreasing order of their atomic radii.



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Activity 5 7 li

1. Are the elements now arranged in the pattern of a period in the Period Table?



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Activity 5 7 lii

1. Which elements have the largest and the smallest ?

| | | | | | | | |
|-----------------------|----|-----|----|----|-----|----|----|
| 2nd period elements : | B | Be | O | N | Li | F | C |
| Atomic radii (pm) : | 88 | 111 | 66 | 74 | 152 | 64 | 77 |



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Activity 5 7 Iv

1. How does the atomic radius change as you go from left to right in a period ?



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Activity 5 8 I

1. Study the variation in the atomic radii of first group elements given below and arrange them in an increasing order.



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Activity 5 8 li

1. Name the elements which have the smallest and the largest atoms.



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Activity 5 8 Iii

1. How does the atomic size vary as you go down a group ?



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Activity 5 9 I

1. Examine elements of the third period and classify them as metals and non-metals.



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Activity 5 9 II

1. 



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Activity 5 9 Iii

1. On which side of the periodic table do you find (i) metals, (ii) non-metals ?



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Activity 5 10 I

1. How would the tendency to gain electrons change as you go down a group?



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Activity 5 10 li

1. How does this tendency (electropositivity) change in a period?



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Activity 5 11 I

1. How would the tendency to gain electrons change as you go from left to right across a period?



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Activity 5 11 li

1. How would the tendency to gain electrons change as you go down a group?



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Activity 5 5 Iii

1. do they contain the same number of shells ?

| | | | | | | | |
|-----------------------|----|-----|----|----|-----|----|----|
| 2nd period elements : | B | Be | O | N | Li | F | C |
| Atomic radii (pm) : | 88 | 111 | 66 | 74 | 152 | 64 | 77 |



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Questions Section In Text Questions

1. Did Döbereiner's triads also exist in the columns of Newlands' octaves? Compare and find out.



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2. What were the limitations of Döbereiner's classification?



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3. What were the limitations of Newlands' law of Octaves ?



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4. Use Mendeléeer's Periodic Table to predict the formulae for the oxides of the following elements: K, C, Al, Si, and Ba.



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5. 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 ?



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6. What were the criteria used by Mendeléeey in creating his Periodic Table?



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7. Why do you think the noble gases are placed in a separate group?



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8. How could the Modern Periodic Table remove various anomalies of Mendeleev's Periodic Table?



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9. Name two elements you would expect to show chemical reactions similar to magnesium. What is the basis for your choice?



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10. Name:

a) three elements that have a single electron in their outermost shells

b) two elements that have two electrons in

their outermost shells .

c) three elements with filled outermost shells



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11. (a) Lithium, sodium, potassium are all metals that react with water to liberate hydrogen gas. Is there any similarity in the atoms of these elements ?

(b) Helium is an unreactive gas and neon is a gas of extremely low reactivity. What, if anything, do their atoms have in common ?



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12. In the Modern Periodic Table, which are the metals among the first ten elements?



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13. By considering their position in the Periodic Table, which one of the following elements would you expect to have maximum metallic characteristics?



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Questions Section Textual Questions

1. Which of the following statements is not a correct statement about the trends when going from left to right across the periods of periodic Table?

A. The elements become less metallic in nature

B. The number of valence electrons increases

C. The atoms lose their electrons more easily

D. The oxides become more acidic

Answer: C



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2. Element X forms a chloride with the formula XCl_2 which is a solid with a high melting point. X would most likely be in the same group of the periodic table as

A. Na

B. Mg

C. Al

D. Si

Answer: B



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3. Which element has:

a] two shells, each completely filled with electrons?

b] the electron configuration 2, 8, 2?

c] three shells, with four electrons in the valence shell?

d] two shells, with three electrons in its valence shell?

e] twice as many electrons in its second shell as in its first shell?



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4. a) What property do all elements in the same column of the periodic table as boron share?

b) What property do all elements in the same column of the periodic table as fluorine share?



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5. An atom has the electronic configuration 2, 8, 7.

a] What is the atomic number of this element?

b] To which of the following elements would it be chemically similar? (Atomic numbers are given in parenthesis) N (7), F (9), P (15), Ar (18)



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6. The position of three elements A, B and C in the periodic Table is shown below:

| Group 16 | Group 17 |
|----------|----------|
| | |
| | A |
| | |
| B | C |

- (a) State whether A is a metal or non-metal
- (b) State whether C is more reactive or less reactive than A
- (c) Will C be larger or smaller in size than B?
- (d) Which type of ion, cation or anion, will be formed by element C?



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7. Nitrogen (atomic number 7) and phosphorous (atomic number 15) belong to group 15 of the periodic table. Write the electron configurations of these two elements. Which of these is more electronegative?



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8. How does the electronic configuration of an element relate to its position in the modern periodic table?



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9. In the modern periodic table, calcium (atomic number 20) is surrounded by elements with atomic numbers 12, 19, 21, and 38. Which of these have physical and chemical properties resembling calcium?



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10. Compare and contrast the arrangement of elements in Mendeleev's periodic table and the Modern Periodic Table.



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**Zee Additional Questions Sections Multiple
Choice Questions**

1. 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.

Answer: C



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2. Where would you locate the element with electronic configuration 2, 8 in the Modern Periodic Table?

A. Group 8

B. Group 2

C. Group 18

D. Group 10

Answer: C



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3. Which of the following is the outermost shell for elements of period 2?

A. K shell

B. L shell

C. M shell

D. N shell

Answer: B



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4. Which of the following elements would lose an electron easily?

A. Mg

B. Na

C. K

D. Ca

Answer: C



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5. Which of the following elements does not lose an electron easily?

A. Na

B. F

C. Mg

D. Al

Answer: B



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6. Arrange the following elements in the order of their decreasing metallic character: Na, Si, Cl, Mg, Al.

A. Cl gt Si gt Al gt Mg gt Na

B. Na gt Mg gt Al gt Si gt Cl

C. Na gt Al gt Mg gt Cl gt Si

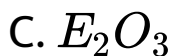
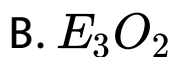
D. Al gt Na gt Si gt Ca gt Mg

Answer: B



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7. What type of oxide would eka-aluminium form?



Answer: C



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8. Three elements B, Si and Ge are

A. Metals

B. Non-metals

C. Metalloids

D. Metal, non-metal, and metalloid
respectively

Answer: C



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9. Which one of the following does not increase while moving down a group of the periodic table?

A. Atomic radius

B. Metallic character

C. Valence electrons

D. Number of shells in an element

Answer: C



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10. Element with atomic number 18 belongs to

A. 2nd period, 8th group

B. 3rd period, 8th group

C. 2nd period, 18th group

D. 3rd period, 18th group

Answer: D



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11. The number of valence electrons present in the 12th element of any period is

A. 12

B. 2

C. 6

D. 0

Answer: B



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12. The valency of any element of group 18 is

A. 18

B. 8

C. 0

D. None of these

Answer: C



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13. Which of the following properties is not a periodic property?

A. Melting point

B. Atomic radius

C. Electronegativity

D. Valency

Answer: A



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14. In the Modern Periodic Table, element helium is placed at the

- A. top left corner
- B. bottom left corner
- C. top right corner
- D. bottom right corner

Answer: C



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15. The first three periods are

- A. long periods
- B. short periods
- C. moderate periods
- D. none of these

Answer: B



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16. Which element was not known when Mendeleev framed the periodic table?

A. Germanium

B. Silicon

C. Uranium

D. Sulphur

Answer: A



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17. Chemical properties of elements depend on

A. their atomic mass

B. their valence-shell electronic configuration

C. their electronic configuration

D. none of above

Answer: B



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18. Which of the following properties of the elements can't be predicted from their position in the periodic table?

A. The formula of its oxides

B. The charge on its ions

C. The number of isotopes

D. Metallic character

Answer: C



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19. Non-metals usually form

A. Acidic oxides

B. Basic oxides

C. Neutral oxides

D. Both acidic and basic oxides

Answer: A



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20. In the Modern Periodic Table, elements with similar valenceshell configuration are placed in

- A. same group
- B. different groups
- C. same period
- D. none of above

Answer: A



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21. Elements in the same group of the periodic table have the same

A. atomic number

B. number of electron shells

C. number of valence electrons

D. atomic mass

Answer: C



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22. Which of the following always increases down a group?

- A. Metallic character
- B. Non-metallic character
- C. Electronegativity
- D. Acidic nature of oxides

Answer: A



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23. Which of the following always decreases down a group?

- A. Metallic character
- B. Non-metallic character
- C. Chemical reactivity
- D. Atomic size

Answer: B



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24. Which parameter decreases as we move from left to right along a period?

A. metallic character

B. valence electrons

C. electronegativity

D. electron shells

Answer: A



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25. The number of valence electrons in an element belonging to period 3 and group 2 of the Modern Periodic Table is

A. 1

B. 2

C. 3

D. 4

Answer: B



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26. The period and group number of an element with atomic number 7 are

A. 2,3

B. 2,4

C. 2,5

D. 2,15

Answer: D



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27. The number of which of the following atomic particles plays a major role in classification of elements in the Modern Periodic Table?

A. neutron

B. electron

C. proton

D. all of the these

Answer: C



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28. The longest period in the Modern Periodic Table is the

- A. Third period
- B. Fourth period
- C. Fifth period
- D. Sixth period

Answer: D



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29. Group I elements in the Modern Periodic Table are known as

- A. alkali metals
- B. alkaline earth-metals
- C. halogens
- D. noble gases

Answer: A



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30. The most reactive element of all the elements is

A. Fluorine

B. Chlorine

C. Carbon

D. Hydrogen

Answer: A



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31. According to Newlands' law of octaves, the number of elements between two similar elements is

A. 6

B. 7

C. 8

D. none

Answer: A



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32. Halogens are present in which group of the Modern Periodic Table?

A. 1st

B. 12th

C. 17th

D. 18th

Answer: C



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33. The 18th group of elements in the periodic table is called

- A. alkali metals
- B. alkaline earth-metals
- C. halogens
- D. noble gases

Answer: D



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34. The electronic configuration of element x is 2, 8, 8, 1 and the electronic configuration of element Y is 2, 8, 7. Then the type of bond formed between these two element is

- A. covalent bond
- B. hydrogen bond
- C. mettalic bond
- D. ionic bond

Answer: D



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35. The number of groups and periods in the modern periodic table respectively, are

A. 7 and 9

B. 18 and 7

C. 7 and 18

D. 9 and 7

Answer: B



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Zee Additional Questions Sections Very Short Answer Vsa Type Questions

1. In a triad of three elements A, B, and C, the atomic mass of A and B are 80 and 120 respectively. Find the atomic mass of element C.



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2. According to Newlands' classification of elements, the properties of element B are similar to element A.

(i) How many elements are there between A and B?

(ii) Starting from A, what is the position of B?



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3. Out of Döbereiner's triads and Newlands' octaves, which classification is better? Why?





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4. State the Modern Periodic law. What is the Modern Periodic Table called?



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5. Define group and period with reference to the Modern Periodic Table.



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6. Compare and contrast the arrangement of elements in Mendeleev's periodic table and the Modern Periodic Table.



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7. How were transition elements placed in (i) Mendeleev's Periodic Table and (ii) Modern Periodic Table?



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8. How do transition elements differ from other elements?



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9. State the Modern Periodic law. Where are metals and nonmetals found in the Modern Periodic Table?



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10. Write the atomic numbers of two elements X and Y having electronic configuration 2, 8, 2 and 2, 8, 6 respectively.



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11. Account for the following: Elements of group 17 are monovalent.



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12. Account for the following: Elements of group 18 are zerovalent.



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13. Elements A, B, C, and D have atomic numbers 1, 8, 11, and 19 respectively. Choose the odd element and give reason for your answer.



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14. Out of the two elements X and Y which has a bigger atomic radius?

(i) X has atomic number = 18 and atomic mass = 40.

(ii) Y has atomic number = 20 and atomic mass = 40.



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15. Out of the two elements, potassium and sodium, which one can lose electrons easily?

Give reason for your answer.



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16. Mention the type of compounds formed between group 1 and group 17 elements.



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17. Write the number of vertical columns in the periodic table. What are these columns called?



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18. Write the number of horizontal rows in the modern periodic table. What are these rows called ?



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19. Predict the maximum number of valence electrons possible for atoms in the first period of the periodic table.



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20. What is the nature of oxides formed by most of p - block elements ?



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21. Explain the acidic character of oxide of elements down a group and across a period.



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22. Why hydrogen should be placed in group I ?



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23. Out of Li and K which has strong metallic character?



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24. List any two properties of the elements belonging to the first group modern periodic table.



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25. Write the formula used to determine the maximum numbers of electrons which a shell in an atom can accommodate.



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26. Name the element and its valency which is having electronic configuration 2, 8, 3.



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27. Lithium, sodium and potassium form a Dobereiner's triad. The atomic masses of lithium and potassium are 7 and 39 respectively. Predict the atomic mass of sodium.



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28. What do you mean by valency?



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29. Sodium and potassium are placed in the same group of modern periodic table. If the molecular formula of sodium sulphate is Na_2SO_4 , So, then decide the molecular formula of potassium sulphate. Give reason for your answer.



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**Zee Additional Questions Sections Short Answer
Sa Type Questions**

1. Elements have been arranged in the following sequence on the basis of their increasing atomic masses: F, Na, Mg, Al, Si, P, S, Cl, Ar, K.

a] Pick two sets of elements which have similar properties.

b) The given sequence represents which law of classification of elements?



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2. Write the formulae of chlorides of Eka-silicon and Eka-aluminium, the elements predicted by Mendeleev.



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3. Arrange the following elements in increasing order of their atomic radii:

a] *Li, Be, F, N* b] *Cl, At, Br, I*



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4. Identify and name the metals out of the following elements whose electronic configurations are given below.

a) 2,8,2

b) 2,8,

c) 2, 8, 7

d) 2,1



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5. Mention any two demerits of the long form of the periodic table.



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6. Why is hydrogen placed separately on the top left corner of the Modern Periodic Table?



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7. Why did the law of triads fail?



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8. Mention the merits of Newlands' law of octaves.



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9. What were the limitations of Newlands' law of Octaves ?



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10. Why do all elements of the same group have similar properties?



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11. The atomic numbers of three elements A, B, and C are 12, 18, and 20 respectively. State, giving reason, which two elements show similar properties.



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12. Taking the example of an element of atomic number 16, explain how the electronic configuration of the atom of an element relates to its position in the Modern Periodic

Table and how valency of an element is calculated on the basis of its atomic number.



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13. The electronic configuration of an element 'X' is 2, 8, 8, 2. To which (a) period and (b) group of the Modern Periodic Table does 'X' belong? State its valency. Justify your answer in each case.



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14. All the members of group I are metals. Li and Na react with water rapidly whereas K, Rb, and Cs react vigorously. Write the electronic configuration of Li and K and find their valency from the given information. Infer the change in reactivity in a group given atomic numbers of Li and K are 3 and 19 respectively.



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15. Atomic number is considered to be a more appropriate parameter than atomic mass for

classification of elements in a periodic table.

Why?



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16. How does the electronegativity changes as we move from left to right across a period ?



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17. How would the tendency to gain electrons change as you go from left to right across a

peroid?



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18. a) How does electropositivity of elements get affected as we move: (i) down a group (ii) across a period?

b] Which atomic property increases as we move across a period and down a group?



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19. Why are metals electropositive and non-metals electronegative in nature? Illustrate by giving an example of each. Why does metallic character of elements increase down a group?



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20. Name three elements with seven valence electrons in their outermost shell. How do their non-metallic character and atomic size change down the group?





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21. Inert gases are placed in a separate group in the Modern Periodic Table

a) State the group number.

b) How many valence electrons do most of them have?

c) Why are they unreactive?

d) Name any two inert gases.



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22. a] What are metalloids? Write any two examples.

b] Given below are some of the elements of the first group: Li, Na, K (their atomic numbers are 3, 11, and 19 respectively and they belong to 2nd, 3rd, and 4th period respectively). Arrange them in the decreasing order of their metallic character.



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23. a] Write the trend of atomic size and metallic character along a group and a period in the Modern Periodic Table.

b]"Elements in the periodic table show periodicity of properties." List any four such properties.



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24. a] Name the element with atomic number 17.

b]To which period does it belong?

c]To which group does it belong?

d]Write its electronic configuration.



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25. Draw a part of the long form of the periodic table showing a non-metal surrounded by non-metals from all the four sides.



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26. (i) Predict which of the following elements will form cation and will form anions ?

(i) Na, (ii) Al, (iii) Cl, (iv) O.

(ii) Name two elements that are inert in nature.



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27. Write the name, symbol and electronic configuration of an element X whose atomic number is 11.



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28. The electronic configuration of an element is 2, 8, 4. State its

i] Group and period in the periodic table

ii] Name and write its one physical property.



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29. Can the following groups of elements be classified as Dobereiner's Triads.

i] Na, Si, Cl

ii] Be, Mg, Ca

$A \rightarrow$ *micmassof*Be - 9, Na - 23, Mg - 24, Si - 28,

Cl - 35, Ca - 40. Justify your answer.



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30. An element 'X' has atomic number 13.

a] Write its electronic configuration.

b] State the group to which 'X' belongs.

c] Is 'X' a metal or non metal?

d] Write the formula of its bromide.



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31. Choose from the following



a] Elements that should be in the same period

b] elements that should be in the same group

State reason for your selection in each case.



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32. How does the valency of elements vary

a) in going down a group

b) in going from left to right in a period of the periodic table.



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33. How would the tendency to lose electrons change as you go

i] from left to right across a period

ii] down a group



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34. i] Atomic radius of hydrogen is 37 pm.

Express it in metres.

ii] How does atomic size vary in a group and in a period.



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35. Arrange the following elements in the descending order of atomic size and give a reason for your answer. Mg, Cl, P, Ar Atomic number of elements is 12, 17, 15, 18.



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36. The position of elements A, B, C, D in the modern periodic table is given in the following table. Answer the following questions by observing the table:

| | Group 1 | Group 2 |
|----------|----------|----------|
| Period 3 | <i>A</i> | <i>B</i> |
| Period 4 | <i>C</i> | <i>D</i> |

i] Which element has the highest atomic size?

Why?

ii] Which element has the least metallic property? Why?



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37. 'Hydrogen occupies a unique position in the Modern Periodic Table.' Justify the statement.



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38. Write the formula of the product formed when the element A (atomic number 19) combines with the element B (atomic number 17). Draw its electron-dot structure. What is the nature of the bond formed?



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39. a) Discuss any two achievements of the Modern Periodic Table.

b) Discuss any two limitations of Mendeleev's classification.

c) How were these removed in the Modern Periodic Table?



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40. a] Why are sodium and chlorine placed in the same period in the Modern Periodic Table?

b] Why do elements placed in the same group of the periodic table have similar chemical properties?

c] Who proposed the modern periodic law? On which fundamental property of an atom is it based?



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41. What is the basis of the Modern Periodic Table? Why lithium with atomic number 3 and potassium with atomic number 19 placed in group one? What are the atomic numbers of the first two elements in the second group?



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42. a] Mention the relative position of metals, non-metals, and metalloids in group 13-16 of the periodic table.

b] Classify the following elements as metals, non-metals, and metalloids.

(i) Calcium (ii) Sulphur (iii) Selenium



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43. The elements Be, Mg, and ^{20}Ca each having two valence electrons in their valence shells are in periods 2, 3, and 4 respectively of the Modern Periodic Table. Answer the following questions associated with these elements, giving reason in each case.

a] In which group should they be?

b] Which one of these is least reactive?

c] Which one of them has the largest atomic size?



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44. Based on the group valency of elements state the formula for the following giving justification for each:

i] Oxides of 1st group elements,

ii] Halides of the elements of group 13, and

iii] Compounds formed when an element of group 2 combines with elements of group 16 .



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45. State three reasons for placing chlorine and bromine in the same group of the periodic table.



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46. Atoms of seven elements A, B, C, D, E, F, and G have different number of electron shells but have the same number of electrons in the outermost shells. How do the following properties vary as we move from A to G? (i) Metallic character (ii) Atomic radii (iii) Valency?



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47. The positions of A, B, C, D, E, F, and G in the Modern Periodic Table are given under:



- a] List the inert elements.
- b] What type of ions would B, C, E, and F form?
- c] Which element could have chemical properties similar to C?
- d] How many shells would A have?
- e] What is the similarity between A and D?
- f] Identify the most abundant element in the earth's crust.



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48. Consider the part of the periodic table given below and answer the following questions.



i) The atom of which element is smaller in size? e or h.

ii) Which element is most electropositive in nature?

iii) Which element has only one proton in its atom?

iv) What is the valency of g?

v) How many valence electrons does g have?

vi) Name the element which is a metalloid.



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49. An element Y has three shells with four electrons in the valence shell. Another element X has twice as many electrons in its second shell as in its first shell. i] Identify the elements X and Y. ii] Is there any similarity between the element Y and X? If so, what?



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50. Lithium is an alkali metal with atomic number = 3 and number of valence electrons =

1. The formula of the hydride of lithium is LiH.

Boron and carbon are placed in group 13 and 14 respectively with valence electrons 3 and 4.

Write the formulae of the hydrides of boron and carbon giving a reason for your answer.



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51. An element X (atomic number 17) reacts with an element Y (atomic number 20) to form a Compound.

i] Write the position of these elements in the Modern Periodic Table

ii] Which one is a metal and which one is a non-metal?

iii] Write the formula of the compound.



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52. An element P (atomic number 20) reacts with an element Q (atomic number 17) to form a compound. Answer the following questions giving reason:

Write the position of P and Q in the Modern Periodic Table and the molecular formula of the compound formed when P reacts with Q.



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53. Arrange giving reason the following elements in the increasing order of their atomic size:

a) Be, O, F (Given that they belong to 2nd, 8th, and 9th groups and 2nd period respectively)

b) I, Cl, F (Given that they belong to 5th, 3rd, and 2nd period respectively in the same group)

c) Mg, N, P (Given that Mg and P belong to 2nd and 15th group respectively of 3rd period and N belongs to 15th group of 2nd period)



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54. The electrons in the atoms of four elements A, B, C, and D are distributed in three shells having 1,3,5, and 7 electrons in their outermost shell respectively. State one period in which these elements can be placed in the Modern Periodic Table. Write the electronic configuration of the atoms A and D and molecular formula of the compound when A and D combine.



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55. Justify the following statements:

a) Cations are smaller in size than the corresponding atom.

b) Size of the atom increases as we move down a group.

c) Atomic size decreases as we move across a period.



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56. Give reasons for the following:

a] Metals have a tendency to form cations.

b] Fluorine atom is smaller than chlorine atom.

c] Non-metals have a tendency to gain electrons.



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57. Given below are some elements of the Modern Periodic Table:

${}_4\text{Be}$, ${}_{26}\text{Fe}$, ${}_{14}\text{Si}$, ${}_{19}\text{K}$, ${}_{20}\text{Ca}$

i) Select the element that has one electron in the outermost shell and write its electronic configuration.

ii) Select two elements that belong to the same group. Give reason.

iii) Select two elements that belong to the same period. Which one of the two has a bigger atomic size?



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58. An element M with electronic configuration (2,8, 2) combines separately with $(NO_3)^{-1}$, $(SO_4)^{2-}$ and $(PO_4)^{3-}$ radicals.

Write the formula of the three compounds so formed. To which group and period of the Modern Periodic Table does the element M belong? Does M form covalent or ionic compounds? Justify your answer.



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59. Na, Mg, and Al are the elements of the 3rd period of the Modern Periodic Table having group number 1, 2, and 13 respectively. Which one of these elements has the a) highest valency, (b) largest atomic radius, and (c) maximum chemical reactivity?



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60. An element 'X' belongs to the 3rd period and group 16 of the Modern Periodic Table.

a) Determine the number of valence electrons and the valency of 'X'.

b] Write the molecular formula of the compound when X reacts with hydrogen and write its electron-dot structure.

c] Name the element X and state whether it is metallic or non-metallic



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61. An element A reacts with oxygen to form A_2O .

i] State the number of electrons in the outermost orbit of A.

ii] To which group of the periodic table does A belong?

iii] State whether A is a metal or a non-metal.



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62. An element has same number of electrons in I and IV shells and in the II and III shells

i] Write its electronic configuration

ii] Write the group and period it belong

iii] What is the valency of the element



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63. i] An element X has both K and L shells completely filled with electrons. The element has atomic number 10. Identify the element X.

ii] In which group of the periodic table this element is placed? iii) Write its electronic configuration. What is its valency?.



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64. From the part of the periodic table answer the following questions.



i] Atomic number of oxygen is 8 what would be the atomic number of Fluorine.

ii] Out of 'X' and 'Q' which element has larger atomic size? Give reason for your answer.

iii) Out of Y and Z which element has smaller atomic size? Give reason for your answer.



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65. An element X placed in 2nd group and 4th period of periodic table burns in the presence of oxygen to form a basic oxide

i) Identify the element

ii) Write its electronic configuration

iii) Write a balanced equation for the reaction when this oxide is dissolved in water



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66. The position of three elements A, B and C in the periodic table is shown below



Give reason and explain

i] Element A is a metal

ii] Element B has larger atomic size than the element C

iii] Element C has a valency of 1.



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67. An element X has mass number 35 and number of neutrons = 18. Write atomic number and electronic configuration of X. Also write

group number, period number and valency of X.



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68. Observe the given table and question:

answer the following

| | | | | | |
|---------------|----------|----------|----------|----------|----------|
| Elements | <i>A</i> | <i>B</i> | <i>C</i> | <i>D</i> | <i>E</i> |
| Atomic number | 11 | 4 | 2 | 7 | 19 |

Identify the two elements that belong to the same period and the two elements that belong to the same group. Give reason for your conclusion.



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69. The atomic numbers of two elements are 8 and 16 respectively. Write the electronic configuration of these two elements. Do you keep these two elements in the same group of the modern periodic table? Justify your answer. Find out which of these two elements is more electronegative. Give reason for your answer.



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Zee Additional Questions Sections Long Answer

La Type Questions

1. Mendeleev predicted the existence of certain elements not known at that time and named two of them as Eka-silicon and Eka-aluminium.

a] Name the elements which have taken the place of these elements.

b] Mention the group and the period of these elements in the Modern Periodic Table.

c] Classify these elements as metals, non-metals, or metalloids.

d] How many valence electrons are present in each?



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2. Which group of elements could be placed in Mendeleev's periodic table without disturbing the original order? Give reason.



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3. Give an account of the process adopted by Mendeleev for the classification of elements.

How did he arrive at "periodic law"?



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4. The elements of a period of the periodic table are given below in order, from left to right, with one of its elements missing

Li Be B C 0 F Ne

i] To which period does these elements

belong?

ii] One element of this period is missing.

Which is the missing element and where should it be placed?

iii] Which one of these elements in the period shows property of catenation?

iv] Which one of the above belongs to the halogen series?

v] Identify the noble gas.



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5. What is meant by a group in the Modern Periodic Table? How do the following change on moving from top to bottom in a group?

i] Number of valence electrons

ii] Number of occupied shells

iii] Size of atoms

iv] Metallic character of elements

v] Effective nuclear charge experienced by valence electrons



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6. Study the following table in which the positions of six elements A, B, C, D, E, and F are shown as they are in the Modern Periodic Table:



On the basis of the above table, answer the following questions:

- i] Name the element which forms only covalent compounds.
- ii] Name the element which is a metal with valency three.
- iii] Name the element which is a non-metal with the valency three.

iv] Out of D and E, which is bigger in size and why?

v] Write the common name for the family to which the elements C and F belong.



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Zee Additional Questions Sections Higher Order Thinking Skills Hots

1. An element becomes another element if the number of

A. protons changes

B. neutrons changes

C. electrons changes

D. Protons, neutrons, and electrons does
not change

Answer: A



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2. Elements in the same period may have

- A. different number of neutrons
- B. same number of shells
- C. different number of electrons
- D. all of these

Answer: D



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3. In a Dobereiner's triad consisting of three elements A, B, and C, the sum of atomic masses of A and B is 115 and the average of

atomic masses A and C is 81. Find the atomic mass of A, B, and C. Predict the names of these elements.



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4. Elements A, B, C, D, E, F, G, H, I, J and have atomic masses 13, 3, 97, 25, 7, 35, 9, 30, 50, and 19 respectively. According to law of octaves, which elements would have similar properties? Explain.



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5. An element X has mass number 35 and number of neutrons = 18. Write atomic number and electronic configuration of X. Also write group number, period number and valency of X.



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6. Properties of the elements are given below.

Where would you locate the following elements in the periodic table?

- a] A soft metal stored under kerosene.
- b] An element with variable (more than one) valency stored under water.
- c] An element which is tetravalent and forms the basis of organic chemistry
- d] An element which is an inert gas with atomic number 2.
- e] An element whose thin oxide layer is used to make other elements corrosion resistant by the process of "anodising".



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7. Locate the position in the periodic table of the following elements on the basis of their properties:

a] An element is an inert gas with atomic number 10.

b] An element is tetravalent and a basic element of organic chemistry

c] A soft metal stored under kerosene that can be cut with knife.



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8. Two elements 'P' and 'Q' belong to the same period of the modern periodic table and are in Group -1 and Group -2 respectively. Compare their following characteristics in tabular form:

(i) The number of electrons in their atoms

(ii) The sizes of their atoms

(iii) Their metallic characters

(iv) Their tendencies to lose electrons

(v) The formula of their oxides

(vi) The formula of their chlorides



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9. Three elements P, Q, and R have successive atomic numbers with same period . If $P > R > Q$ in terms atomic size. Predict the group of each element. Give reason.



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Questions

1. The electronic configuration , group number and period number of an element with atomic

number 10 is



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2. to find electronic configuration , group number and period number of an element from its atomic number

potassium atomic number 19



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