



### **CHEMISTRY**

## BOOKS - OSWAAL CHEMISTRY (KANNADA ENGLISH)

# PERIODIC CLASSIFICATION OF ELEMENTS

**Topic 1 Multiple Choice Questions** 

**1.** The atomic number of an element 'X' is 16. In the modern periodic table the elements belongs to this block and period.

A. p-block,  $3^{rd}$  period

B. p-block,  $2^{nd}$  period

C. s-block,  $3^{rd}$  period

D. s-block,  $2^{nd}$  period

#### Answer: A



1. In how many blocks are elements divided ?

A. A. 4

B. B.7

C. C.18

D. D.8

**Answer: A** 

1.

Column A	Column B		
(1) Valence electron	<ul> <li>(a) Decreases from left to right in a period.</li> </ul>		
(2) Electronegativity	(b) Long form of periodic table.		
(3) Atomic size	(c) Number of electrons in valence shell		

(4) Nature of oxide	<ul> <li>(d) Tendency to attract shared pair of elec- trons</li> <li>(e) On going down in a group acidic to basic</li> </ul>		
(5) Niels Bohr			

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**Topic 1 Very Short Answer Type Questions** 

1. State modern periodic law of classification of

elements.







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



7. Write the number of vertical columns in the

modern periodic table. What are these

columns called ?

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

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**9.** Write two reasons responsible for late discovery of noble gases.

10. Give reason why noble gases are placed in

separate group in modern periodic table.

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**11.** 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.



#### **Topic 1 Short Answer Type Questions I**

1. State Mendeleev's periodic law. Write two

achievements of Mendeleev's periodic table.

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#### 2. What is the basis of modern periodic table?

**3.** How does the electronic configuration of an atom of an element related to its position in the modern periodic table ? Explain with one example.



**4.** State two main properties of elements on which Mendeleev's periodic classification was based.

Why position of hydrogen is not fixed in his periodic table ?

#### **Topic 1 Short Answer Type Questions li**

1. State the main aim of classifying elements. Which is the more fundamental property of elements that is used in the development of Modern Periodic Table ? Name and state the law based on this fundamental property. On which side of the periodic table one can find metals, non-metals and metalloids?

2. (i) Who proposed Modern Periodic Law ?

(ii) What was the basis of arranging the

elements in it?

(iii) State the Modern Periodic Law.

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**3.** (a) Which two criteria did Mendeleev use to classify the elements in his periodic table ?(b) State Mendeleev's periodic law.

(c) Why is it not possible to give a fixed position to hydrogen in Mendeleev's periodic table ?

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- **4.** (i) What are metalloids?
- (ii) Name any four metalloids?

5. (i) In Mendeleev's Periodic Table, the elements were arranged in the increasing order of atomic masses. However, cobalt with atomic mass of 58.93 a.m.u. was placed before nickel having an atomic mass of 58.71 a.m.u. Give reason for the same. (ii) Write the formula of chlorides of Ekasilicon and Eka-aluminium, the elements predicted by Mendeleev.



6. 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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7. How does the tendency of the elements to lose electrons change in the Modern Periodic Table in (i) a group, (ii) a period and why?

8. (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.



**9.** Give an example of :

(i) A metal that is liquid at room temperature.

(ii) A non-metal that is liquid at room

temperature.

(iii) An inert gas (At. No  $\,<\,$  20)



**10.** (i) How does the electronic configuration of an atom relates to its position (period and group) in the modern periodic table ? (ii) Would you place the two isotopes of chlorine, Cl -35 and Cl -37, in different slots because of their different atomic masses or in



**12.** How could the Modern Periodic Table remove various anomalies of Mendeleev's



**13.** How does the electronic configuration of an atom related to its position in the modern periodic table ?

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**Topic 1 Long Answer Type Questions** 

**1.** (i) Why do we classify elements ?

(ii) What are the two criteria used in the development of Modern Periodic Table ?(iii) State the position of (a) metals, (b) nonmetals and (c) metalloids in the periodic table.

(iv) Would you place two isotopes of chlorine, Cl-35 and Cl-37 in different slots of the periodic table because of their different atomic masses or in the same slot because their chemical properties are same ? Justify your answer.



2. (a) Which two criteria did Mendeleev use to classify the elements in his periodic Table? (b) State Mendeleev's periodic law. (c) Why could no fixed position be given to hydrogen in Mendeleev's Periodic Table? (d) How and why does the atomic size vary as you go (i) from left to right along a period

(ii) down a group ?

**3.** (a) Why did Mendeleev have gaps in his periodic table ?

(b) State any three limitations of Mendeleev's classification ?

(c) How does electronic configurations of atoms change in a period with increase in atomic number?

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**Topic 2 Multiple Choice Question** 

**1.** A part of s-block in the modern periodic table is given here. The correct arrangement of these atoms in the increasing order of there atomic size is



A. Na, Mg, K

B. K, Na, Mg

C. Mg, Na, K

D. Na, K, Mg

Answer: C

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**2.** Choose the ion with the largest size.

B.  $O^{2-}$ 

C.  $Na^+$ 

D.  $Mg^{2\,+}$ 

#### Answer: B

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#### **Topic 2 Very Short Answer Type Questions**

**1.** An element has atomic number 3. To which period of the periodic table does it belong?



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



**4.** Give the number of elements in  $2^{nd}$  and  $5^{th}$ 

period in Modern Periodic Table.



5. Write the atomic numbers of two elements

'X' and 'Y' having electronic configuration 2, 8,

2 and 2, 8, 6 respectively.

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



**7.** Write any one difference between the electronic configuration of group-1 and group-

2 elements.



8. There are 7 electrons in the outermost 'L' shell of an element. Predict the period and group in the periodic table this element belongs to.

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**9.** The electronic configuration of two elements X and Y are 2,8,7 and 2,8,8,3 respectively. Write atomic numbers of X and Y.



**10.** The atomic number of three element X, Y and Z are 3, 11 and 17 respectively. State giving reason which two elements will show similar chemical properties.

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**11.** Name two elements of first period in

modern periodic table.

12. On which side of the periodic table do you

find (i) metals, (ii) non-metals ?

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**13.** What is the similarity in the valency of all the elements of group 1 in the modern periodic table?

14. How does the electronegativity changes as

we move from left to right across a period ?

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15. How does metallic character of a metal

depend on the size of atom?

**16.** State the similarity in the electronic configuration of all the elements present in group 1 of the periodic table.



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



**18.** The atomic number of three element X, Y and Z are 3, 11 and 17 respectively. State giving reason which two elements will show similar chemical properties.



#### Topic 2 Short Answer Type Questions I

**1.** What is ionisation energy? How does ionisation energy vary along the period in the modern periodic table ?

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**3.** Elements in the periodic table show periodicity of properties. List any four such properties.


4. Mention any two trends exhibited by elements when we go from left to right across the period of periodic table.

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**5.** How does the metallic character of the elements vary (i) in a group, (ii) in a period of the modern periodic table ?

6. 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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7. How does the atomic radius change as we

go:

(i) from left to right across a period

(ii) down a group in the periodic table ?



8. (i) State the basis of classification of elements in the modern periodic table ?(ii) How does the metallic character of element vary as we go down the group.

**9.** How does metallic character of elements vary on moving from :

(i) Left to right in a period ?

(ii) From top to bottom in a group ?

Give reasons for your answers.

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**10.** The atomic radii of three elements A, B and C of a periodic table are 186 pm, 104 pm and 143 pm respectively. Giving a reason, arrange these elements in the increasing order of

atomic numbers in the period.



**11.** (i) Atomic number of Mg and Al are 12 and 13, respectively. Write down their electronic configuration.

(ii) Mention the period of the modern periodic

table to which the above two elements belong.

Give reason for your answer.



**12.** 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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**13.** Three elements X, Y and Z belong to  $17^{th}$  group but  $2^{nd}$ ,  $3^{rd}$  and  $4^{th}$  period respectively. Number of valence electrons in Y is 7. Find the number of valence electrons in X and Z.



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14. 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.

**15.** 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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**16.** Na, Mg, Al and P belong to  $3^{rd}$  period but are placed in first, second, thirteenth and fifteenth group. Number of shells occupied in Mg is three. What is the number of occupied shells in Na, Al and P. Give reasons for your answer.





17. (i) Element 'Y' with atomic number 3 combines with element 'A' with atomic number 17. What would be the formula of the compound ?
(ii) What is the electronic configuration of an element with atomic number 10 ? What will be its valency?

**18.** (i) How does the tendency to gain electrons change as we go down the group ? Give reason.

(ii) Given below is a part of the periodic table.How does the valency vary, as we movevertically downward from Li to Fr. Give reason.

Li	Be
Na	
к	
Rb	
Cs	
Fr	Ra



19. Given below are atomic radii of same elements of second period.
Element B O N C
Atomic Radii in pm 88 66 74 77
Arrange these elements in the increasing order of their atomic number. Give reason for your answer.

**20.** Out of the elements X and Y, which has bigger atomic radius? Give reason to justify your answer.

(i) X has atomic number 18 and atomic mass40.

(ii) Y has atomic number 20 and atomic mass40.

**21.** Two elements X and Y have atomic numbers 12 and 16 respectively. To which period of the modern periodic table do these two elements belong ? What type of bond will be formed between them and why?



## 22. The atomic number of elements A, B, C, D

#### and E are given below:

Element	A	B	с	D	E
Atomic no.	7	10	12	4	19

From the above table, answer the following questions :

(i) Which two elements are chemically similar ?

(ii) Which is an inert gas ?

(iii) Which element belongs to 3 period of periodic table ?

(iv) Which element among these is a nonmetal ?

23. The position of three elements X, Y and Z in

the periodic table are shown below:

(i) Which type of ion, cation or anion, will be

formed by element X ?

(ii) Which element, Y or z, has the atom of

comparatively larger size ?

Give reason in each case.

Group 1	Group 2
-	-
x	-
-	-
Y	Z



24. (i) An element has electronic configuration2, 8, 6. Explain its position in the periodic table.(ii) Size of sodium atom is bigger than that ofhydrogen atom. Why?

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**25.** Some of the elements and their atomic numbers are mentioned in the following table

Element	Atomic number	
P	3	
Q	17	
R	13	
S	11	

. . . . . . . . . . . . .

(i) How many valence electrons are there in the element 'R' ?

(ii) What is the valency of 'P' ?

(ii) Write the chemical formula of the compound formed by combining the elements 'P' and 'Q'?

(iv) Out of the two elements 'P' and 'S', which

one is larger in size ?

### **Topic 2 Short Answer Type Questions Ii**

**1.** The atomic numbers of two elements A and B are 11 and 12 respectively. Which element exhibits highest metallic property ? Why ? Write the molecular formula of the compounds formed when these elements combine with the element 'Z' having atomic number 8. **2.** The atomic numbers of five elements A, B, C, D and E are 6, 8, 3, 7 and 9 respectively. (i) Which is the element having the highest electropositivity among these elements ? Why? (ii) Which is the element having the least metallic character among these elements ? Why?

(iii) What is your conclusion about the relationship between metallic character and electropositivity of an element ?



3. What is meant by atomic radius ? Explain

why it decreases across a period ?



**4.** a] Name the element with atomic number17.

b]To which period does it belong?

c]To which group does it belong?

d]Write its electronic configuration.





**5.** "Electronegativity is the case of gaining electrons".

(a) Which type of elements will have high electronegativity?

(b) How does electronegativity change as we

move

(i) across a period

(ii) down a group ?

6. How many groups and periods are there in the modern periodic table? How do the atomic size and metallic character of elements vary as we move ?

(i) down a group and

(ii) from left to right in a period.



**7.** Write the number of periods the modern periodic table has. State the changes in

valency and metallic character of elements as we move from left to right in a period. Also state the changes, if any, in the valency and atomic size of elements as we move down a group.

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8. (a) Define the following terms:

(i) Valency, (ii) Atomic size.

(b) How do the valency and the atomic size of

the elements vary while going from left to

right along a period in the modern periodic

table ?



9. 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



**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

**11.** Calcium is an element with atomic number 20. Stating reason for each of the following questions :

(i) Is calcium a metal or non-metal?

(ii) Will its atomic radius be larger or smaller

than that of potassium with atomic number 19

?

(iii) Write the formula of its oxide.

**12.** Name any two elements of group one and write their electronic configurations. What similarity do you observe in their electronic configurations ? Write the formula of oxide of any of the above said element.



**13.** An element 'M' with electronic configuration (2,8,2) combines separately with  $NO_3^-$ ,  $SO_4^{2-}$  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 ? Will 'M' form covalent or ionic compounds? Give reason to justify your answer.

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**14.** Two elements P and Q belong to the 3rd period of the Modern Periodic Table and are in group 1 and 2 respectively. Compare their following characteristics in tabular form:

- i] The number of electron in their atoms
- ii] The size of their atoms
- iii] Their metallic character
- iv] Their tendencies to lose electrons
- v] The formula of their oxides
- vi] The formula of their chlorides.

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**15.** An element 'X' (Atomic number = 20) burns in the presence of oxygen to form a basic oxide. (i) Identify the element and write its electronic configuration.

(ii) State its group number and period number

in the Modern Periodic Table.

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

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**16.** An element 'X' belongs to third period and second group of the Modern Periodic Table.

(i) Write its electronic configuration.

(ii) Is it a metal or non-metal? Why?

(iii) Write the formula of the compound

formed when 'X' reacts with an element

(a) Y of electronic configuration 2, 6 and (b) Z

with electronic configuration 2, 8, 7.



17. The atomic number of an element 'X' is 19.

(i) Write its electronic configuration.

(ii) To which period of the Modern Periodic

Table does it belong and what is its valency? (iii) If 'X' burns in oxygen to form its oxide, what will be its nature - acidic, basic or neutral ?

(iv) Write balanced chemical equation for the reaction when this oxide is dissolved in water.



18. 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



**19.** 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

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20. Three elements 'X', 'Y' and 'Z' have atomic numbers 7, 8 and 9 respectively.
(i) State their positions (Group number and period number both) in the Modern Periodic Table.

(ii) Arrange these elements in the decreasing order of their atomic radii.

(iii) Write the formula of the compound

formed when 'X' combines with 'Z'.



**21.** The position of eight elements in the modern periodic table is given below where atomic numbers of elements are given in the parenthesis.

Periodic No.	Elements	
2	Li(3)	Be(4)
3	Na(11)	Mg(12)
4	K(19)	Ca(20)
5	Rb(37)	Sr(38)

(i) Write the electronic configuration of Ca.

(ii) Predict the number of valence electrons in Rb.

(iii) What is the number of shells in Sr?

(iv) Predict whether K is a metal or a nonmetal.

(v) Which one of these elements has the largest atom in size ?

(vi) Arrange Be, Ca, Mg and Rb in the increasing order of the size of their respective atoms.
22. Four elements A, B, C and D have atomic numbers 12, 13, 14 and 15 respectively.
Answer the following questions giving reasons :
(i) What is the number of valence electrons

and valency of D?

(ii) Which of them will have largest atomic radii ?

(iii) Which of these elements will form the most basic oxide ?

**23.** From the following elements :

 $_{-}~(4)Be,_{9}F,_{19}K,_{20}Ca$ 

(i) Select the element having one electron in the outermost shell.

(ii) Two elements of the same group.

Write the formula and mention the nature of

the compound formed by the union of

(19)K and element X (2,8,7).

24. Na, Mg and Al are the elements of the same period of modern periodic table having one, two and three valence electrons respectively. Which of these elements (i) has the largest atomic radius, (ii) is least reactive ? Justify your answer stating reason for each case.

**25.** The elements  $_{-}(4)Be_{,12} Mg$  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,

(i) In which group should they be?(ii) Which one of them is least reactive ?(iii) Which one of them has the largest atomic size ?

**26.** 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



27. The atomic number of an element 'X' is 20.
(i) Determine the position of the element 'X' in the periodic table.
(ii) Write the formula of the compound formed when 'X' reacts/combines with another element 'Y' (atomic number 8).
(iii) What would be the nature (acidic or basic)

of the compound formed ? Justify your answer.



**28.** Four elements P, Q, R and S belong to the third period of the Modern Periodic Table and have respectively 1,3,5 and 7 electrons in their outermost shells. Write the electronic configurations of Q and R and determine their valencies. Write the molecular formula of the compound formed when P and S combine.

29. In the following table, the positions of six

elements A, B, C, D, E and F are given as they

are in the Modern Periodic Table :

Group→ Period↓	1	2	3-12	13	14	15	16	17	18
2	A			В		С			D
3					E	1		0	F

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 valency three.

(iv) Out of B and C, whose atomic radius is

bigger and why?

(v) Write the common name for the family to

which the elements D and F belong.



**30.** 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 the

outermost shell respectively. State the period in which these elements can be placed in the modern periodic table. Write the electronic configuration of the atoms of A and D and the molecular formula of the compound formed when A and D combine.

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

(i) Oxides of  $1^{st}$  group elements,

(ii) Halides of the elements of group 13, and

(iii) Compounds formed when an element of

group 2 combines with, an element of group

16.

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32. Consider two elements 'A' (Atomic number

17) and 'B' (Atomic number 19):

(i) Write the positions of these elements in the

modern periodic table giving justification.

(ii) Write the formula of the compound formed

when 'A' combines with 'B.'

(iii) Draw the electron dot structure of the

compound and state the nature of the bond

formed between the two elements.

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**33.** Study the following table in which positions of six elements A, B, C, D, E and F are shown as they are in the modern periodic table :

$\begin{array}{c} \operatorname{Group} \\ \rightarrow \\ \operatorname{Period} \downarrow \end{array}$	1	2	3-12	13	14	15	15	17	18
1.	A			-	-	B	10		C
2.			-	D	E				F

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 valency three.

(iv) Out of D and E, which is bigger is size and why ?

(v) Write the common name for the family to

which the elements C and F belong.



34. The elements Li, Na and K, each having one valence electron, are in period 2, 3 and 4 respectively of modern periodic table.(1) In which group of the periodic table should they be?

(ii) Which one of them is least reactive ?

(iii) Which one of them has the largest atomic

radius?

Give reason to justify your answer in each

case.

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**35.** An atom has electronic configuration 2, 8,

2.

(i) What is the atomic number of this element

?

(ii) What is its valency?

(iii) To which of the following elements would

it be chemically similar and why ? (Be-4, 0-8.

Justify your answer.)



**36.** Two elements X and Y belong to group 1 and 2 respectively in the same period of the periodic table. Compare these elements with respect to :

(i) number of electrons in their outermost orbit

(ii) their valencies

(iii) metallic character

(iv) their atomic size

(v) formula of their chlorides

(vii) formula of their sulphates.

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# 37. Four elements A, B, C and D along with

their electronic configuration are given below:

Elements	Λ	B	C	D
Electronic configuration	2, 1	2, 8	2, 8, 1	2, 8, 8

Now answer the following questions:

(i) Which two elements belong to the same

period ?

(ii) Which two elements belong to the same

group?

(iii) Which element out of A and C is more

reactive and why?



38. Four elements A, B, C and D have atomic

numbers 12, 13, 14 and 15 respectively.

Answer the following questions giving reasons

(i) What is the number of valence electrons and valency of D?

(ii) Which of them will have largest atomic radii ?

(iii) Which of these elements will form the most basic oxide ?

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**39.** Three elements X, Y and Z have atomic numbers 7, 10 and 14 respectively.

(i) Identify the group number of theseelements in the periodic table.(ii) Mention one unique feature each of

elements Y and Z.

(iii) Which of the above two elements belong

to the same period ?



**40.** From the following part of the periodic table, answer the following questions:

1 Lithium	2	13	14 Carbon	15	16 Oxygen	17 Fluorine
х			Р	1.1		Q
Y						R
Z						Т

- (i) Which is the most reactive metal?
- (ii) Name the family of fluorine Q, R, T.
- (iii) Name one element each of group 2 and 15.
- (iv) Give the name of the element P placed below carbon.

(v) Compare X and P with respect to the size of atoms.



## 41. The position of three elements A, B and C

in the periodic table are shown below :

$\begin{array}{l} \text{Groups} \rightarrow \\ \text{Periods} \downarrow \end{array}$	1	2	3
1			A
П			В
ш		C	

IV		
v	a second	
VI		
VII		1
VIII	and the second second	

Give reasons to explain the following:

(i) Element 'A' is a metal.

(ii) Element 'B' has larger size than 'C'.

(iii) Element 'C' has a valency - 3.



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

 $_4Be, \, _{26}Fe. \, _{14}Si, \, _{19}K_{20}Ca$ 

 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?



**43.** Write the number of period the modern periodic table has. How do the valency and metallic character of elements vary on moving from left to right in a period ? How do the valency and atomic size of elements vary down a group ?

**44.** 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) Write the formula of the compound formed. Justify your answer in each case.



$\begin{array}{l} \mathbf{Group} \rightarrow \\ \mathbf{Period} \downarrow \end{array}$	1	2	13	14	15	16	17	18
3	x		B	С	D	E		1.11
4	Y							
5	Z					10		-

45.

Using the given part of the periodic table, answer the following questions with reason : (i) Name the element having smallest atomic size.

(ii) Write electronic configuration of element E.
(iii) Identify the elements which have similar
physical and chemical properties as the
element Y.

### **Topic 2 Long Answer Type Questions**

1. Examine the elements of the third period and classify them as metals or non-metals. Comment on the metallic and non-metallic character of the third period. Name the most metallic element and non-metallic element of this period.

2. Which element has :

(i) two shells, both of which are completely filled with electrons ?

(ii) the electronic configuration, 2, 8, 2.

(iii) a total of three shells, with four electrons

in its valence shell ?

(iv) a total of two shells, with three electrons

in its valence shell ?

(v) Twice as many electrons in its second shell

as in its first shell ?



**3.** An element is placed in 2nd group and 3rd period of the periodic table, burn in presence of oxygen to form a basic oxide :

(i) Identify the element

(ii) Write the electronic configuration

(iii) Write the balanced equation when it burns

in the presence of air.

(iv) Write a balanced equation when this oxide

is dissolved in water.

(v) Draw the electron dot structure for the

formation of this oxide.



- **4.** An element X (2, 8, 2) combines separately with  $SO_4^{2-}$ ,  $PO_4^{3-}$  radicals.
- (i) Write the formulae of the two compounds so formed.

(ii) To which group of the modern periodictable does the element X belong?(iii) Will it form covalent or ionic compound ?Give reasons.



5. Atoms of eight elements A, B, C, D, E, F, G and H have the same number of electronic shells but different in their outermost shells. It was found that elements A and G combine to form an ionic compound which can also be extracted from sea water. Oxides of the elements A and B are basic in nature while those of E and F are acidic. The oxide of elements D is almost neutral. Answer the following questions based on the information given here in :

(i) To which group or period of the periodic

table do the listed elements belong ?

(ii) Which one of the eight elements is likely to

be a noble gas?

(iii) Which one of the eight elements would

have the largest atomic radius ?

(iv) Which two elements amongst these are

likely to be the non-metals?

(v) Which one of these eight elements is likely

to be a semi-metal or metalloid ?

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Ncert Corner Intext Questions

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



2. What were the limitations of Döbereiner's

classification?

3. What were the limitations of Newlands' law

of Octaves ?

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**4.** Use Mendeléer's Periodic Table to predict the formulae for the oxides of the following elements: K, C, AI, SI, and Ba.

**5.** Besides gallium, which other elements have since been discovered that were left by Mendeleev in his periodic Table ?



# 6. What were the criteria used by Mendeléey in

creating his Periodic Table?

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



**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



**11.** (a) Lithium, sodium, potassium are all metals that react with water to liberate hydrogen gas. Is there any similarly 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 ?





**13.** By considering their position in the Periodic Table, which one of the following elements would you expect to have maximum metallic characteristic: Ga, Ge, As, Se, and Be?

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## Ncert Corner Textbook Exercises

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

A. The elements become less metallic in nature.

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  $XCI_2$  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





- 3. Which element has :
- (i) two shells, both of which are completely filled with electrons ?
- (ii) the electronic configuration, 2, 8, 2.
- (iii) a total of three shells, with four electrons
- in its valence shell ?
- (iv) a total of two shells, with three electrons
- in its valence shell ?
- (v) Twice as many electrons in its second shell
- as in its first shell ?





**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?



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:



(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?



**8.** How does the electronic configuration of an atom related to its position in the modern periodic table ?



**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?



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

