

### 3. VALENCY SOLUTIONS

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#### TEACHING TASK

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#### JEE MAINS LEVEL QUESTIONS

1. When carbon combines with hydrogen, what is the valency of carbon in methane ( $\text{CH}_4$ )?

a) 1 b) 2 c) 3 d) 4

**Answer:d**

Solution: Carbon forms 4 bonds with hydrogen in  $\text{CH}_4$ , so its valency is 4.

2. When sulfur combines with hydrogen to form hydrogen sulfide ( $\text{H}_2\text{S}$ ), what is the valency of sulfur?

a) 1 b) 2 c) 3 d) 4

**Answer:b**

Solution:Sulfur bonds with 2 hydrogen atoms, so its valency is 2.

3. What is the valency of phosphorus when it combines with hydrogen to form phosphine ( $\text{PH}_3$ )?

a) 1 b) 2 c) 3 d) 4

**Answer:c**

Solution:Phosphorus forms 3 bonds with hydrogen in  $\text{PH}_3$ , so its valency is 3.

4. When nitrogen reacts with oxygen to form nitrogen dioxide, what is the valency of nitrogen in the compound?

a) 2 b) 4 c) 3 d) 5

**Answer:b**

Solution:Oxygen has a valency of 2.

In  $\text{NO}_2$ , total valency of oxygen =  $2 \times 2 = 4$ .

Nitrogen balances this with a valency of 4.

5. When chlorine combines with oxygen to form chlorine dioxide ( $\text{ClO}_2$ ), what is the valency of chlorine in the compound?

a) 1 b) 2 c) 3 d) 4

**Answer:d**

Solution:Oxygen has a valency of 2.

Total valency of oxygen =  $2 \times 2 = 4$ .

Chlorine balances this with a valency of 4.

6. In the compound sulfur trioxide ( $\text{SO}_3$ ), what is the valency of sulfur?

a) 2 b) 4 c) 6 d) 8

**Answer:c**

Solution:Oxygen has a valency of 2.

Total valency of oxygen =  $3 \times 2 = 6$ .

Sulfur balances this with a valency of 6.

7. What is the valency of phosphorus when it combines with oxygen to form phosphorus pentoxide ( $\text{P}_2\text{O}_5$ )?

a) 2 b) 3 c) 4 d) 5

**Answer:d**

Solution:Each P atom bonds with 5 oxygen valencies (since O has valency 2).

The effective valency of phosphorus is 5.

8. In the compound  $\text{PCl}_3$  (phosphorus trichloride), what is the valency of phospho-

rus?

- a. 1            b. 2            c. 3            d. 4

**Answer:c**

Solution: Phosphorus forms 3 bonds with chlorine, so its valency is 3.

9. In the compound  $\text{Cl}_2\text{O}_7$  (dichlorine heptoxide), what is the total valency of chlorine atoms?

- a. 14            b. 7            c. 10            d. 5

**Answer:a**

Solution: Each oxygen has a valency of 2.

Total valency of oxygen =  $7 \times 2 = 14$ .

Since there are 2 chlorine atoms, their combined valency must balance oxygen, so 14.

10. If an element X has an atomic number of 12, what is the likely charge of its dipositive ion?

- a) +1 b) -2 c) +2 d) -1

**Answer:c**

Solution: Atomic number 12 (Magnesium) has 2 valence electrons.

Losing 2 electrons gives a +2 charge.

11. If an element with atomic number 15 loses three electrons, what charge will its ion have?

- a) +1 b) +2 c) +3 d) -3

**Answer:c**

Solution: Atomic number 15 (Phosphorus) has 5 valence electrons.

Losing 3 electrons leaves it with a +3 charge (since protons > electrons).

12. Valency electrons and valency respectively in Ar

- A) 7,0            B) 8,0            C) 0,7            D) 0,82.

**Answer:B**

Solution: Argon (atomic number 18) has a full octet: 8 valence electrons.

Since its outer shell is complete, its valency is 0 (inert gas).

13. Which of the following electronic configuration is not wrong ?

- A) Be (3) = 2, 1    B) O (8) = 2, 6    C) S (16) = 2, 6, 8    D) Ca (20) = 2, 8, 10

**Answer:B**

Solution: Oxygen (O) has 8 electrons, correctly written as 2, 6 (K=2, L=6).

Other options are wrong:

A) Be (4): Correct config is 2, 2 (not 2,1).

C) S (16): Correct config is 2, 8, 6 (not 2,6,8).

D) Ca (20): Correct config is 2, 8, 8, 2 (not 2,8,10).

14. A neutral atom of an element has a nucleus with a nuclear charge 13 times and mass 27 times that of hydrogen nucleus. How many electrons would be in its stable positively charged ion

- A) 27            B) 14            C) 13            D) 10

**Answer:D**

Solution: Nuclear charge = +13 → Atomic number = 13 (Aluminum).

Neutral Al has 13 electrons.

Stable ion of Al is  $\text{Al}^{3+}$  (loses 3 electrons), so remaining electrons = 10.

15. How many electrons can occupy the first energy level of an atom?

- a. 2 b. 4 c. 6 d. 8

**Answer:a**

Solution:The first energy level (K-shell) holds a maximum of 2 electrons (formula:  $2n^2 = 2(1)^2 = 2$ ).

16. What is the maximum number of electrons that can be accommodated in the third energy level of an atom?

- a. 2 b. 8 c. 18 d. 32

**Answer:c**

Solution:The third energy level (M-shell) can hold up to 18 electrons (formula:  $2n^2 = 2(3)^2 = 18$ ).

17. Which of the following elements is known for exhibiting variable valency?

- a) Sodium b) Magnesium c) Iron d) Chlorine

**Answer:c**

Solution:Iron (Fe) shows variable valency ( $\text{Fe}^{2+}$  and  $\text{Fe}^{3+}$ ) due to involvement of 4s and 3d electrons.

Others (Na, Mg, Cl) have fixed valencies.

18. Which of the following statements is true about variable valency?

- a. It is only observed in nonmetals.  
b. It is unrelated to the electron configuration of an element.  
c. It is a property mainly exhibited by alkali metals.  
d. It is associated with the ability of elements to involve electrons in outermost shell and penultimate shell

**Answer:d**

Solution:Variable valency occurs when elements (often transition metals like Fe or Cu) use electrons from outermost and penultimate shells.

### **MULTIPLE CORRECT ANSWER TYPE**

1. Which elements from the alkali metal group are known to have a valency of 1 when forming hydrides?

- a. Lithium b. Sodium c. Potassium d. Rubidium

**Answer:a,b,c,d**

Solutions:All alkali metals (Group 1) have 1 valence electron and form hydrides (e.g., LiH, NaH, KH, RbH) with a valency of 1.

2. Elements with a valency of 3 when combining with hydrogen include:

- a. Boron b. Aluminum c. Nitrogen d. Phosphorus

**Answer:a,b,c,d**

Solutions:Boron (B) forms  $\text{BH}_3$  (borane) with valency 3.

Aluminum (Al) forms  $\text{AlH}_3$  (alane) with valency 3.

Nitrogen (N) and phosphorus (P) form  $\text{NH}_3$  (valency 3) and  $\text{PH}_3$  (valency 3)

3. Which of the following statements are correct

- A) Atom can be converted into anion by gaining electrons.  
B) Valency and valency shell electrons gives the same meaning.  
C) Noble gases are stable regarding chemical reactions.

**Answer:A,C**

Solutions:

A) Correct: An anion forms when an atom gains electrons (e.g.,  $\text{Cl} \rightarrow \text{Cl}^-$ ).

B) Incorrect: Valency = Combining capacity (e.g., O has valency 2).

Valence electrons = Electrons in the outermost shell (e.g., O has 6 valence electrons).

C) Correct: Noble gases (He, Ne, Ar, etc.) are chemically inert due to stable octets.

4. Which of the following atomic numbers shows Valency of 2

A) 4 B) 14 C) 12 D) 20

**Answer: A, C, D**

Solutions: A) 4 (Be): Group 2  $\rightarrow$  Valency 2.

C) 12 (Mg): Group 2  $\rightarrow$  Valency 2.

D) 20 (Ca): Group 2  $\rightarrow$  Valency 2.

B) 14 (Si): Group 14  $\rightarrow$  Valency 4 (not 2).

#### **REASON AND ASSERTION TYPE**

5. Assertion: Valency is the combining capacity of an atom based on its electrons in the outermost shell.

Reason: The valency of oxygen is determined by its outermost electron shell, and it tends to form two bonds to achieve a stable electron configuration.

**Answer: A**

Solution: Assertion (True): Valency is indeed determined by the outermost shell electrons.

Reason (True): Oxygen has 6 valence electrons and needs 2 more to complete its octet, so its valency is 2. The Reason correctly explains the Assertion.

6. Assertion: Oxygen generally exhibits a valency of 2.

Reason: Oxygen has six electrons in its outer shell, and to achieve a stable configuration, it tends to gain two electrons or share electrons with other atoms.

**Answer: A**

Solution: Assertion (True): Oxygen commonly forms 2 bonds (e.g.,  $\text{H}_2\text{O}$ ,  $\text{CO}_2$ ).

Reason (True): Oxygen gains 2 electrons (or shares) to complete its octet, justifying the valency of 2.

7. Assertion: Group 1 elements, such as sodium and potassium, exhibit a valency of 1 when combining with hydrogen.

Reason: Group 1 elements have one electron in their outer shell, and they readily lose this electron to achieve a stable configuration, forming compounds with a valency of 1.

**Answer: A**

Solution: Assertion (True): Alkali metals (Na, K, etc.) form 1 bond (e.g.,  $\text{NaH}$ ,  $\text{KH}$ ).

Reason (True): They lose 1 electron to achieve stability, giving them a valency of 1.

8. Assertion: Chlorine exhibits a valency of 1 when combining with other elements.

Reason: Chlorine has seven electrons in its outer shell and tends to gain one electron to achieve a stable octet, resulting in a valency of 1.

**Answer: A**

Solution: Assertion (True): Chlorine forms 1 bond (e.g.,  $\text{HCl}$ ,  $\text{NaCl}$ ).

Reason (True): It gains 1 electron to complete its octet, justifying the valency of 1.

9 Assertion: Group 17 elements, including fluorine and bromine, share a similar

valency trend with chlorine when combining with other elements.

Reason: Group 17 elements have seven electrons in their outer shell and generally gain one electron to achieve a stable octet, leading to a common valency trend of 1 when combining with other elements.

**Answer:A**

Solution:Assertion (True): All halogens (F, Cl, Br, I) typically show a valency of 1 (e.g., HF, NaCl, KBr).

Reason (True): They all have 7 valence electrons and gain 1 electron to complete their octet, explaining the consistent valency trend.

**STATEMENT TYPE**

10. Statement-I : Halogens have 7 Valence electrons

Statement-II : Halogens shows valency 7

**Answer:3**

Solution:Statement-I (Correct): Halogens (Group 17: F, Cl, Br, I) indeed have 7 valence electrons.

Statement-II (Incorrect): Halogens do not show valency 7. Instead, they gain 1 electron to complete their octet, giving them a valency of 1 (e.g., HCl, NaCl).

11. Statement-I : Elements having 1, 2 or 3 valency electrons are metals

Statement-II : Hydrogen has valency 1

**Answer:2**

Solution:Statement-I (Correct): Most metals (e.g., Na, Mg, Al) have 1, 2, or 3 valence electrons and lose them to form positive ions.

Statement-II (Correct): Hydrogen has 1 valence electron and shows a valency of 1 (e.g., H<sub>2</sub>O, HCl)

**COMPREHENSION TYPE**

**COMPREHENSION-1**

A neutral atom of an element has a nucleus with nuclear charge 11 times and mass 23 times that of hydrogen.

12. Write the electronic configuration of the element

(A) 2, 1 B) 2, 8, 1 C) 2, 8 D) 2, 8, 8, 3

**Answer:B**

Solution:Sodium (Na) has 11 electrons in a neutral atom.

Its electronic configuration is: 2, 8, 1 (K=2, L=8, M=1).

13. Find the ratio of electrons to protons present in its stable ion

A) 1 : 1 B) 5 : 6 C) 10 : 11 D) 12 : 11

**Answer:C**

Solution:Protons (p) = 11 (atomic number = nuclear charge).

Neutral atom electrons = 11.

Stable ion of Na = Na<sup>+</sup> (sodium loses 1 electron to achieve stability).

Electrons in Na<sup>+</sup> = 11 - 1 = 10.

Protons remain 11 (unchanged).

Ratio (e<sup>-</sup> : p) = 10 : 11.

## COMPREHENSION-II

14. When hydrogen combines with oxygen to form water, what is the ratio of hydrogen atoms to oxygen atoms?

A) 1:1 B) 2:1 C) 1:2 D) 2:2

**Answer:B**

Solution:The formula for water is  $H_2O$ .

This means 2 hydrogen atoms combine with 1 oxygen atom.

Ratio of H : O = 2 : 1.

15. When oxygen combines with chlorine, the common valency ratio is:

a) 1:1 b) 1:2 c) 2:1 d) 2:2

**Answer:b**

Solution:Oxygen needs 2 bonds (valency = 2)

Each chlorine provides 1 bond (valency = 1)

Therefore, 2 chlorine atoms are needed to satisfy oxygen's valency

The compound formed is  $Cl_2O$

Valency ratio is 1:2

## INTEGER TYPE

16. Valency Exhibited by Nitrogen in  $N_2O_5$  is \_\_\_\_\_

**Answer:5**

Solution:Let valency of N = x

2 N atoms  $\times$  Valency x = 2x

Since the compound is neutral:  $2x = 10 \rightarrow x = 5$

17. Valency exhibited by Sn are

**Answer:4,2**

Solution>About Tin (Sn):Atomic number = 50

Electronic configuration:  $[Kr] 4d^{10} 5s^2 5p^2$

Belongs to Group 14 (Carbon family)

Possible Valencies:

Main valency: 4 (loses all 4 valence electrons:  $5s^2 5p^2$ )

Less common valency: 2 (loses only  $5p^2$  electrons)

Examples:

$SnCl_4$  (Valency = 4)

$SnCl_2$  (Valency = 2)

Conclusion: Tin exhibits two valencies: 2 and 4.

## MATRIX MATCHING TYPE

18.

Column I

Element

(A) Lead

(B) Carbon

(C) Cobalt

(D) Mercury

Column II

Valency

(P) 2,3

(Q) 1,2

(R) 2,4

(S) 3,4

A) A-R B-R C-P D-Q B) A-R B-R C-S D-P

C) A-S B-P,Q C-R D-P D) A-S B-P,Q,R,S C-R D-Q

**Answer:A**

Solution:1. Lead (Pb)

Group 14 element (like Carbon).

Shows two valencies due to the inert pair effect:

+4 (common, e.g.,  $\text{PbO}_2$ ).

+2 (e.g.,  $\text{PbO}$ ).

Valency: 2, 4

2. Carbon (C)

Group 14 element.

Typically exhibits 4 valency (e.g.,  $\text{CH}_4$ ,  $\text{CO}_2$ ).

In rare cases (e.g.,  $\text{CO}$ ), it shows 2 valency.

Valency: 2, 4

3. Cobalt (Co)

Transition metal (Group 9).

Common valencies:+2 (e.g.,  $\text{CoCl}_2$ ).

+3 (e.g.,  $\text{Co}_2\text{O}_3$ ).

Valency: 2, 3

4. Mercury (Hg)

Group 12 element. Shows two valencies:

+1 (mercurous, e.g.,  $\text{Hg}_2\text{Cl}_2$ ).

+2 (mercuric, e.g.,  $\text{HgCl}_2$ ).

Valency: 1, 2

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### LEARNERS TASK

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#### CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ'S)

1.  $\text{Fe}^{3+}$  will be pronounced as

A) Ferrous B) Iron C) Ferric D) Ironic

**Answer:C**

Solution: $\text{Fe}^{2+}$  = Ferrous

$\text{Fe}^{3+}$  = Ferric (traditional naming system for variable valency metals).

2. Reason for variable valency

A) Outer orbit contains different electrons in different conditions

B) Along with valence electrons, inner electrons also participate under such conditions

C) Nuclear charge changes, so attraction decreases in certain conditions

D) All the above

**Answer:B**

Solution:Variable valency occurs mainly in transition metals because:

They can use both outer and inner (d-orbital) electrons for bonding.

3. The valency of hydrogen is one in  $\text{PH}_3$ . What is the valency of nitrogen

A) 1 B) 2 C) 3 D) 4

**Answer:C**

Solution:In  $\text{NH}_3$ , nitrogen combines with 3 hydrogen atoms (each H has valency 1).

Thus, nitrogen's valency = 3.

4. The electronic configuration of calcium with atomic number 20, is

A) 2, 8, 10 B) 2, 9, 9 C) 2, 8, 8, 2 D) 2, 10, 8

**Answer:C**

Solution:Calcium ( $Z=20$ ) follows the order:

K-shell: 2

L-shell: 8

M-shell: 8

N-shell: 2 (valence electrons).

5. Which of the following elements (atomic number given in brackets) have valency 2 ?

A) C (6) B) P (15) C) Mg (12) D) Ar (18)

**Answer:C**

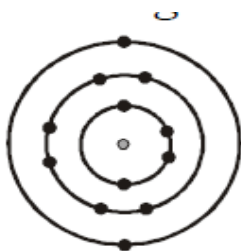
Solution:Mg (12): Group 2  $\rightarrow$  Valency = 2.

Others:C (6): Valency = 4.

P (15): Valency = 3 or 5.

Ar (18): Valency = 0 (noble gas).

6. Given figure represents an atom of



A) chlorine B) magnesium C) calcium D) Wrong structure

**Answer:D**

Solution:K shell have only 2 electrons but in the above structure 4. So it is wrong structure.

7. Valence electrons and valency respectively in calcium

A) 2, 1 B) 2, 2 C) 8, 2 D) 2, 8

**Answer:B**

Solution:Calcium ( $Z=20$ ):Valence electrons = 2 (outermost shell).

Valency = 2 (loses 2 electrons to stabilize).

8. Two atoms of hydrogen combine with one atom of oxygen to form a molecule of water. The valency of hydrogen is

A) 3 B) 1 C) 2 D) 4

**Answer:B**

Solution:In  $H_2O$ , 2 hydrogen atoms (valency 1 each) combine with 1 oxygen (valency 2).

Thus, hydrogen's valency = 1.

### JEE MAIN LEVEL QUESTIONS

1. In the compound ammonia ( $NH_3$ ), what is the valency of nitrogen?

a) 1 b) 2 c) 3 d) 4

**Answer:c**

Solution:Nitrogen forms 3 bonds with hydrogen in  $NH_3 \rightarrow$  Valency = 3.



2. What is the valency of chlorine when it reacts with hydrogen to form hydrochloric acid (HCl)?

a) 1 b) 2 c) 3 d) 4

**Answer:a**

Solution:Chlorine forms 1 bond with hydrogen in HCl → Valency = 1.

3. When magnesium reacts with hydrogen to form magnesium hydride ( $\text{MgH}_2$ ), what is the valency of magnesium?

a) 1 b) 2 c) 3 d) 4

**Answer:b**

Solution:Magnesium bonds with 2 hydrogen atoms in  $\text{MgH}_2$  → Valency = 2.

4. When nitrogen reacts with oxygen to form nitrogen dioxide, what is the valency of nitrogen in the compound?

a) 2 b) 4 c) 3 d) 5

**Answer:b**

Solution:Oxygen has a valency of 2.

Total valency of 2 O atoms =  $2 \times 2 = 4$ .

Nitrogen balances this with a valency of 4.

5. In the compound  $\text{AlCl}_3$  (aluminum trichloride), what is the valency of aluminum?

a. 1 b. 2 c. 3 d. 4

**Answer:c**

Solution:Aluminum forms 3 bonds with chlorine in  $\text{AlCl}_3$  → Valency = 3.

6. What is the valency of chlorine in the compound  $\text{CCl}_4$  (carbon tetrachloride)?

a. -1 b. 0 c. +1 d. +4

**Answer:a**

Solution:Chlorine gains 1 electron to complete its octet → Valency = -1

7. Valency of sulphur in  $\text{SO}_2$  and  $\text{SO}_3$  is

A) 4,6 B) 6,4 C) 2,3 D) 3,2

**Answer:A**

Solution: $\text{SO}_2$ :Oxygen valency =  $2 \times 2 = 4$  → Sulfur valency = 4.

$\text{SO}_3$ :Oxygen valency =  $3 \times 2 = 6$  → Sulfur valency = 6.

8. Valency of carbon in  $\text{CH}_4$ ,  $\text{C}_2\text{H}_6$ ,  $\text{C}_2\text{H}_4$ ,  $\text{C}_2\text{H}_2$  is

A) 1,2,3,4 B) 4,3,4,2 C) 4,6,4,2 D) 4,4,4,4

**Answer:D**

Solution:Carbon always has a valency of 4 in these compounds (forms 4 bonds).

9. If an atom has 17 electrons, how many electron shells does it have?

a. 1 b. 2 c. 3 d. 4

**Answer:c**

Solution:Electronic configuration: 2, 8, 7 → 3 shells.

10. What is the maximum number of electrons that can occupy the outermost energy level of an atom?

a. 2      b. 4      c. 6      d. 8

**Answer:d**

Solution:The outermost shell can hold up to 8 electrons (octet rule).

11. In which energy level do you find the valence electrons of an atom?

a. First energy level      b. Second energy level  
c. Third energy level      d. Outermost energy level

**Answer:d**

Solution:Valence electrons are in the outermost shell.

12. The electronic configuration of an element X is 2, 8,7.

A) O<sub>2</sub> B) H<sub>2</sub> C) Cl D) Ne

**Answer:C**

Solution:Atomic number = 17 → Chlorine (Cl).

13. Which of the following electronic configuration represents a noble gas ?

A) 2, 8, 2 B) 2, 8, 6 C) 2, 8 D) 2, 8, 8, 2

**Answer:C**

Solution:Neon (Ne) has a stable octet (2,8).

14. Name and atomic number of an element whose atom has the electronic configuration 2, 8, 4.

A) Aluminium - 13 B) Sulphur - 14

C) Silicon - 14 D) Phosphorus-15

**Answer:C**

Solution:Atomic number = 14 → Silicon (Si).

### **ADVANCED LEVEL QUESTIONS MULTIPLE CORRECT ANSWER TYPE**

1. Valency is a

A) Number of electrons gained B) Number of electrons lost

C) Number of electrons shared D) Valency electrons

**Answer:A,B,C**

Solution:Valency refers to the combining capacity of an atom, which can be achieved through:

Gaining electrons (e.g., Cl gains 1 electron → Valency = 1).

Losing electrons (e.g., Na loses 1 electron → Valency = 1).

Sharing electrons (e.g., Carbon shares 4 electrons → Valency = 4).

Why D is incorrect?

"Valency electrons" refers to the number of electrons in the outermost shell, not valency itself.

2. Elements with a valency of 2 when combining with hydrogen include:

a. Oxygen b. Calcium c. Sulfur d. Magnesium

**Answer:a,b,c,d**

Solution:a. Oxygen (Forms H<sub>2</sub>O → Valency = 2).

b. Calcium (Forms CaH<sub>2</sub> → Valency = 2).

C.Sulfur (forms H<sub>2</sub>S → valency is 2)

d. Magnesium (Forms MgH<sub>2</sub> → Valency = 2).

### **REASON AND ASSERTION TYPE**

3. Assertion: Chlorine exhibits a valency of -1 when combining with hydrogen.

Reason: Chlorine has seven electrons in its outer shell and tends to gain one electron to achieve a stable octet, forming compounds with a valency of 1 when combining with hydrogen.

**Answer:A**

Solution:Assertion (True):In HCl, chlorine gains 1 electron → Valency = -1 (ionic)

or 1 (covalent).

The term "valency" here refers to combining capacity, which is 1 (though the charge is -1).

Reason (True): Chlorine (Group 17) has 7 valence electrons and gains 1 electron to complete its octet.

4. Assertion: Nitrogen can exhibit different valencies, including 3, when combining with hydrogen.

Reason: Nitrogen has five electrons in its outer shell and can gain three electrons when combining with hydrogen, resulting in a valency of 3.

**Answer:C**

Solution: Assertion (True):

Nitrogen shows valency 3 in  $\text{NH}_3$  (shares 3 electrons).

It also exhibits valency 5 in compounds like  $\text{HNO}_3$ .

Reason (Partially True but Incorrect Explanation):

Nitrogen does not gain electrons in  $\text{NH}_3$ ; it shares 3 electrons (covalent bonding).

The Reason incorrectly states "gains three electrons," which is false for  $\text{NH}_3$ .

### COMPREHENSION TYPE

#### COMPREHENSION-1

A neutral atom of an element has a nucleus with nuclear charge 11 times and mass 23 times that of hydrogen.

5. The element can form a stable charged ion by

(A) losing 1 electron B) losing 2 electrons

(C) gaining 1 electron D) gaining 2 electrons

**Answer:A**

Solution: Sodium (Na) forms a stable  $\text{Na}^+$  ion by losing 1 electron from its outermost shell.

This matches the noble gas configuration of neon (2,8).

#### COMPREHENSION-II

6. Which of the following elements is likely to have the electron configuration 2,8,8?

a. Magnesium (Mg) b. Sulfur (S) c. Argon (Ar) d. Potassium (K)

**Answer:c**

Solution: Argon (Ar): Atomic number = 18  $\rightarrow$  Configuration: 2,8,8  $\rightarrow$  (stable noble gas).

7. Which of the following elements is likely to have the electron configuration 2,8,4?

a. Magnesium (Mg) b. Sulfur (S) c. Argon (Ar) d. Silicon (Si)

**Answer:d**

Solution: Electron configuration: 2, 8, 4 (total electrons = 14).

This matches Silicon (Si), a Group 14 element.

### INTEGER TYPE

8. Valency exhibited by Copper in its "-ic" condition is \_\_\_\_

**Answer:2**

Solution: Copper (Cu) exhibits two valencies:

+1 (e.g., Cuprous oxide,  $\text{Cu}_2\text{O}$ ).

+2 (e.g., Cupric oxide,  $\text{CuO}$ ).

**MATRIX MATCHING TYPE****9. Answer: A-R, B-S, C-Q, D-P**

Solution:

Column I	Column II
Element	Valence electrons
(A) Sodium	(R) 1
(B) Carbon	(S) 4
(C) Magnesium	(Q) 2
(D) Fluorine	(P) 7

**KEY**

				TEACHING TASK					
				JEE MAINS LEVEL QUESTIONS					
1	2	3	4	5	6	7	8	9	10
D	B	C	B	D	C	D	C	A	C
11	12	13	14	15	16	17	18		
C	B	B	D	A	C	C	D		
				MULTIPLE CORRECT ANSWER TYPE					
1	2	3	4	5	6	7	8	9	10
A,B,C,D	A,B,C,D	A,C	A,C,D	A	A	A	A	A	3
11	12	13	14	15	16	17	18		
2	B	C	B	B	5 4,2	A			
				LEARNERS TASK					
				CUQ'S					
1	2	3	4	5	6	7	8		
C	B	C	C	C	D	B	B		
				JEE MAIN LEVEL QUESTIONS					
1	2	3	4	5	6	7	8	9	10
C	A	B	B	C	A	A	D	C	D
11	12	13	14						
D	C	C	C						
				ADVANCED LEVEL QUESTIONS					
1	2	3	4	5	6	7	8	9	
A,B,C	A,B,C,D	A	C	A	C	D	2	A-R, B-S, C-Q, D-P	