

## 2. SYMBOLS AND FORMULAE

### SOLUTIONS

### TEACHING TASK

### JEE MAINS LEVEL QUESTIONS

#### Multiple Choice Question Type :

1. Name the metallic element present in the green colour pigment of the leaves  
A) Carbon                      B) Magnesium                      C) Oxygen                      D) Nitrogen

**Answer:B**

Solution: The green pigment in leaves is chlorophyll, which contains magnesium at its center.

2. Identify the elements present in the given compounds?  
(i)  $\text{CCl}_4$                       (ii)  $\text{NH}_3$                       (iii)  $\text{SO}_2$   
A) (i) → Calcium, Chromium, (ii) → Ammonia, Helium, (iii) Sodium, Ozone  
B) (i) → Carbon, Chlorine, (ii) → Nitrogen, Hydrogen, (iii) → Sulphur, Oxygen  
C) (i) → Copper, Cobalt, (ii) → Neon, Helium, (iii) → Selenium, Ozone  
D) NONE

**Answer:B**

Solution:  $\text{CCl}_4$  = Carbon + Chlorine

$\text{NH}_3$  = Nitrogen + Hydrogen

$\text{SO}_2$  = Sulphur + Oxygen

3. The element present in diamond and graphite  
A) Iron                      B) Gold                      C) Silver                      D) Carbon

**Answer:D**

Solution: Both diamond and graphite are allotropes of carbon.

4. The atomic number of Bromine element is  
A) 41                      B) 32                      C) 34                      D) 35

**Answer:D**

Solution: Bromine (Br) has an atomic number of 35.

5. Which of the following statement is correct  
A) Symbol of Cobalt is "CO"  
B) Symbol of Manganese is "MN"  
C) if the symbol consists of two letters, always it would be first two letters of the name of the element  
D) All are incorrect

**Answer:D**

Solution: A) Cobalt's symbol is Co (not CO).

- B) Manganese's symbol is Mn (not MN).  
 C) Not all symbols are the first two letters (e.g., Gold = Au, Lead = Pb).  
 6. Which of the following statements are correct  
 A) Atomic number of Rubidium is 35    B) Atomic number of Iodine is 73  
 C) Atomic number of Gold is 78        D) Atomic number of Silver is 47

**Answer:D**

Solution:A) Rubidium (Rb) has atomic number 37 (not 35).

B) Iodine (I) has atomic number 53 (not 73).

C) Gold (Au) has atomic number 79 (not 78).

D) Correct: Silver (Ag) has atomic number 47.

7. Which of the following symbols are correctly arranged in the increasing order of atomic number  
 A) Mn, Ni, Co    B) Sc, V, Ti    C) Pt, Au, Hg    D) All are correct

**Answer:C**

Solution:A) Mn (25), Co (27), Ni (28) ? Incorrect order.

B) Sc (21), Ti (22), V (23) ? Given as Sc, V, Ti (incorrect).

C) Correct: Pt (78) < Au (79) < Hg (80).

8. 1 Which of the elements are in sequence with respect to their atomic numbers sequence  
 A) Fe, Ni, Co    B) Ar, Cl, S    C) S, Ar, K    D) V, Ti, Sc

**Answer:C**

Solution:A) Fe (26), Co (27), Ni (28) ? Given as Fe, Ni, Co (incorrect).

B) Ar (18), Cl (17), S (16) ? Decreasing order (incorrect).

C) Correct: S (16), Ar (18), K (19) ? Sequential (though not consecutive).

D) V (23), Ti (22), Sc (21) ? Decreasing order (incorrect).

9. The atomic number of an element is 74. Which of the following statements are correct about that element  
 A) Its latin name is Wolfram    B) It is used as filament in bulbs  
 C) Its common name is Tungsten    D) All are correct

**Answer:D**

Solution:The element is Tungsten (W):

A) Its Latin name is Wolfram.

B) It is used as a filament in bulbs.

C) Its common name is Tungsten.

**JEE ADVANCED LEVEL QUESTIONS****Mutli Correct Answer Type :**

10. Which of the following symbols of elements are correct?  
 A)Mercury - Hg    B) Sodium - S    C) Potassium - K    D) Fluorine - F

**Answer:A,C,D**

Solution:A) Mercury - Hg → Correct (Latin: Hydrargyrum)

B) Sodium - S → Incorrect (Sodium's symbol is Na, from Latin Natrium)

C) Potassium - K →Correct (Latin: Kalium)

D) Fluorine - F → Correct

11. Which of the following things are not correctly Matched with atomic number, Name of element and symbol,  
 A) 50-Tin-Sb    B) 55-Caesium-Ca

C) 72-Hafnium-Ha

D) 71-Lutetium-Lu

**Answer:A,B,C**

Solution:A) 50 - Tin - Sb → Incorrect

Tin's symbol is Sn (from Latin Stannum).

Sb is the symbol for Antimony (Atomic No. 51).

B) 55 - Caesium - Ca → Incorrect

Caesium's symbol is Cs (not Ca).

Ca is the symbol for Calcium (Atomic No. 20).

C) 72 - Hafnium - Ha → Incorrect

Hafnium's symbol is Hf (not Ha).

Ha is not a valid symbol for any element.

D) 71 - Lutetium - Lu → Correct

Lutetium's symbol is indeed Lu.

**Statement Type :**12. **Statement I** : The symbol of Tungsten is W**Statement II** : Its German name is wolfram**Answer:A**

Solution:Statement I is correct because Tungsten's symbol is W (not "Tg").

Statement II is correct because the name "Wolfram" (from German) is why its symbol is W.

Statement II explains Statement I, as the symbol comes from its German name

13. **Statement I** : For all elements their first letter indicates their symbols**Statement II** : The symbol of Rubidium is Ru**Answer:Both are incorrect**

Solution:Statement I is incorrect because not all elements have symbols based on their first letter.

Then Statement II is incorrect (since Rubidium's symbol is Rb).

**Comprehension Type :****Comprehension-I :**

14. Which of the following element names are not correctly matched with their Symbols

A) Argon-Ag

B) Arsenic-Ar

C) Argentinum-Ar

D) All the above

**Answer:D**

Solution:Argon's correct symbol is Ar (not Ag).

Arsenic's correct symbol is As (not Ar).

The correct Latin name for Silver is "Argentum" (Ag).

**Comprehension-II :**

15. Which of the following symbols are correctly matched with their atomic numbers

A) Ca-17

B) I - 54

C) 74-Hf

D) Hg-80

**Answer:D**

Solution:Calcium (Ca) has an atomic number of 20, not 17.

Iodine (I) has an atomic number of 53, not 54.

Hafnium (Hf) has an atomic number of 72, not 74.

Mercury (Hg) has an atomic number of 80.

16. Which of the following are related to the atomic number 22  
A) Symbol of the element is Ta    B) its preceding element has symbol Si  
C) Its Succeeding element is Vanadium    D) All are correct

**Answer:C**

Solution:Atomic number 22 corresponds to Titanium (Ti).

The element after Ti (22) is Vanadium (V, 23).

**Integer Type :**

17. The atomic number of an element which are used for uplifting balloons is\_\_\_\_\_

**Answer:2**

Solution:The gas used for uplifting balloons is Helium (He).

Helium has an atomic number of 2.

It is a lighter-than-air gas, making it ideal for balloons.

18. Atomic number of the element which is mainly responsible for Fluorosis in Nalgonda.

**Answer:9**

Solution:Fluorosis is caused by excessive intake of Fluorine (F).

Fluorine has an atomic number of 9.

Nalgonda district (Telangana, India) is known for fluoride-contaminated groundwater, leading to fluorosis.

---

## LEARNERS TASK

---

### CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

**Mutiple Choice Question Type :**

1. The scientist who suggested a method of representing elements using the english letters is  
A)Lavoisier    B)J.J . Berzelius    C) Robert boyle    D) Rutherford

**Answer:B**

Solution:Jöns Jacob Berzelius introduced the modern system of chemical symbols using letters (first letter or first two letters of the element's name).

2. The symbol of magnesium is  
A) Mn    B) Mg    C) Na    D) Mu

**Answer:B**

Solution:Magnesium's symbol is Mg, derived from its name.

3. The name of element plutonium is derived from:  
A)Scientist    B)Laboratories    C)Planets    D)Country

**Answer:C**

Solution:Plutonium (Pu) is named after the dwarf planet Pluto, following uranium (Uranus) and neptunium (Neptune).

4. Au is the symbol for the element  
A) Arsenic    B) Gold    C) Aluminium    D)Silver

**Answer:B**

Solution:Au comes from the Latin name Aurum, meaning gold.

5. Ag is the symbol for the element  
A) Arsenic    B) Gold    C) Aluminium    D)Silver

**Answer:D**

Solution: Ag comes from the Latin name Argentum, meaning silver.

6. Hydragrum and Wolfram are the latin names for the elements

- A) Tungsten and Tin                      B) Tin and Tungsten  
C) Mercury and Tungsten                D) Silver

**Answer: C**

Solution: Hydragrum (Hg) = Mercury

Wolfram (W) = Tungsten

7. A symbol of an element has

- A) Qualitative significance only        B) Quantative significance only  
C) Both A and B                              D) None

**Answer: C**

Solution: Qualitative: Represents the element's name.

Quantitative: Represents one atom of the element (e.g., 'O' = one oxygen atom).

8. The symbol for the element Astatine is

- A) As                                      B) At                                      C) Ai                                      D) An

**Answer: B**

Solution: Astatine's symbol is At, derived from its name.

9. Which of the following symbol of an element is derived from latin name

- A) Bohrium                      B) Polonium                      C) Uranium                      D) potassium

**Answer: D**

Solution: Potassium's symbol is K (from Latin Kalium).

10. Which of the following is symbol of silver

- A) Ag                                      B) Ga                                      C) Au                                      D) Cd

**Answer: A**

Solution: Ag is from Latin Argentum (silver).

## JEE MAINS LEVEL QUESTIONS

### Mutiple Choice Question Type :

1. Which of the following statements is /are false

- A) the symbol of carbon monoxide is co        B) The symbol of copper is Cu  
C) The symbol of Calcium is CA                      D) The symbol of carbon is C

**Answer: A, C**

Solution: A) False: The symbol of carbon monoxide is CO (capitalized as "Co" is cobalt).

B) True: Copper's symbol is Cu (from Latin Cuprum).

C) False: Calcium's symbol is Ca (not "CA").

D) True: Carbon's symbol is C.

2. The element present in the thermometer

- A) iron                                      B) Mercury                                      C) Water                                      D) Carbon

**Answer: B**

Solution: Mercury (Hg) is used in thermometers due to its liquid state at room temperature and uniform expansion.

3. Your teacher uses me. I'm the metallic element present in chalk

- A) Calcium                                      B) Argon                                      C) Tungeston                                      D) Carbon

**Answer: A**

Solution: Chalk is primarily calcium carbonate ( $\text{CaCO}_3$ ), containing calcium (Ca).

4. Which of the following is used in pensils?

- A) Carbon                      B) Silicon                      C) Charcoal                      D) Phosphorous

**Answer:A**

Solution:Pencils use graphite, a form of carbon (not to be confused with charcoal or silicon).

5. W is the symbol of

- A) Tin                      B) Antimony                      C) Tungsten                      D) Ferrus

**Answer:C**

Solution:W comes from its German name Wolfram.

6. Which of the following matches with Atomic Number, Name of Element and Symbol

- A) 13-Aluminium-AL                      B) 12-Magnesium-Mn  
C) 5-Beryllium-Be                      D) 28- Nickel-Ni

**Answer:D**

Solution:A) Incorrect: Aluminium's symbol is Al (not "AL").

B) Incorrect: Magnesium's symbol is Mg (not "Mn").

C) Incorrect: Beryllium's atomic number is 4 (not 5).

D) Correct: Nickel (Ni) has atomic number 28.

7. Which of the following is correctly matched

Column-I	Column-II	Column-III
A) Argentum	Gold	Ag
B) Kalium	Sodium	Na
C) Plumbum	Lead	Pb
D) Stibium	Tin	Sn

**Answer:C**

Solution:A) Incorrect: Argentum is silver (Ag), not gold.

B) Incorrect: Kalium is potassium (K), not sodium.

C) Correct: Plumbum = Lead (Pb).

D) Incorrect: Stibium is antimony (Sb), not tin.

8. Names of the elements which are correctly matched with Sodium, Tin and Potassium

- A) Kalium, Stannum, Natrium                      B) Natrium, Stannum, Kalium  
C) Stannum, Natrium, Kalium                      D) Natrium, Kalium, Stannum

**Answer:B**

Solution:Sodium = Natrium (Na), Tin = Stannum (Sn), Potassium = Kalium (K)

9. Which of the following Element is named after the name of the scientist

- A) Rubidium                      B) Cuprum                      C) Lawrencium                      D) All the above

**Answer:C**

Solution:Lawrencium (Lr) honors Ernest Lawrence. Others:

Rubidium: From Latin rubidus (red).

Cuprum: Latin for copper.

10. Which of the elements are correctly matched with atomic numbers 58 and 71

- A) Lanthanum, Lawrencium                      B) Cerium, Lutetium  
C) Lanthanum, Lutetium                      D) Cerium and Hafnium

**Answer:B**

Solution:Cerium (Ce) = 58, Lutetium (Lu) = 71.

11. Which of the following are correct

- A) Ar-18                      B) Kr-36                      C) Xe-54                      D) All the above

**Answer:D**

Solution:Ar (Argon) = 18

Kr (Krypton) = 36

Xe (Xenon) = 54

12. Which of the following is odd from others

- A) Mg                      B) As                      C) Cl                      D) Be

**Answer:B**

Solution:Mg (Magnesium), Cl (Chlorine), and Be (Beryllium) are alkaline earth/alkali metals or halogens.

As (Arsenic) is a metalloid, making it the odd one.

**JEE ADVANCED LEVEL QUESTIONS****Mutli Correct Answer Type :**

13. Which of the following elements following latin names

- A)Sodium                      B) Potassium                      C) Iron                      D) Mercury

**Answer:A,B,C,D**

Solution:Element      Symbol      Latin Name

Sodium      Na      Natrium

Potassium      K      Kalium

Iron      Fe      Ferrum

Mercury      Hg      Hydrargyrum

14. Which of the following is correct statement

- A) The symbol of nobelium is Nb      B) The sypmbol of bohrium is Bo  
C) The symbol of Curium is Cm      D) The symbol of Rutherfordium is Rf

**Answer:C,D**

Solution:A) Incorrect: Nobelium's symbol is No (Nb is Niobium)

B) Incorrect: Bohrium's symbol is Bh (not Bo)

C) Correct: Curium is Cm

D) Correct: Rutherfordium is Rf

15. Identify the major elements present in the bones from the following

- A) Oxygen                      B) Carbon                      C) Calcium                      D) Phosphorus

**Answer:A,C,D**

Solution:Major bone components are:

Calcium (C) - main mineral component

Phosphorus (D) - in calcium phosphate

Oxygen (A) - present in bone matrix

Carbon (B) is present but not a major component compared to these three

**Comprehension Type :**

16. Which of the following element has the symbol "Tm"

- A) Tellurium      B) Thulium      C) Terbium      D) Technetium

**Answer:B**

Solution:The symbol "Tm" stands for Thulium (atomic number 69)

Other options:

- A) Tellurium has symbol "Te"  
C) Terbium has symbol "Tb"  
D) Technetium has symbol "Tc"

**Integer Type :**

17. An element which occupies highest percentage in atmosphere has the atomic number\_\_\_\_\_

**Answer:7**

Solution:The most abundant element in Earth's atmosphere is Nitrogen (N), which makes up about 78% of the air.

Atomic number of Nitrogen = 7

18. Atomic number of the element which is essential for the survival of living organism

**Answer:8**

Solution:Oxygen (O) is essential for respiration and survival of most living organisms.

Atomic number of Oxygen = 8

19. Atomic number of an element which has the ability to form a variety of stable compounds, which can exist freely in nature is\_\_\_\_\_

**Answer:6**

Solution:Carbon (C) is known for its ability to form a vast number of stable compounds (organic chemistry).

It exists freely in nature in forms like graphite, diamond, and fullerenes.

Atomic number of Carbon = 6

**Matrix Matching Type :****20.Answer:B**

Solution:

**Column-I**

- a) Elements with symbols derived from latin name
  - b) Elements named after scientists
  - c) Elements named after countries
  - d) Elements named after planets
- A) A-4,B-3,C-2,D-1  
C) A-3,B-1,C-2,D-4

**Column-II**

- 2) Sodium
  - 1) Mendelevium
  - 4) Ruthenium
  - 3) Neptunium
- B) A-2,B-1,C-4,D-3  
D) A-1,B-4,C-3,D-3

21. **Answer:C****Solution:****Symbol**

- A. Hg  
 B. K  
 C. Sn  
 D. Au  
 E. Pb  
 A) A-1, B- 2, C-3, D-4,E-5  
 C) A-5, B-1, C-4, D-2, E-3

**Element**

5. Mercury  
 1. Potassium  
 4. Tin  
 2. Gold  
 3. Lead  
 B) A-5,B-1,C- 2,D-4,E-3  
 D) A-5,B-1,C- 3,D-2,E-4

**KEY****Teaching Task**

1	2	3	4	5	6	7	8	9	10
B	B	D	D	D	D	C	C	D	ACD
11	12	13			14	15	16	17	18
ABC	A	Both are incorrect			D	D	C	2	9

**Learners Task****CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)**

1	2	3	4	5	6	7	8	9	10
B	B	C	B	D	C	C	B	D	A

**JEE MAIN & ADVANCED LEVEL**

1	2	3	4	5	6	7	8	9	10
A,C	B	A	A	C	D	C	B	C	B
11	12	13	14	15	16	17	18	19	20
D	B	ABCD	CD	A,C,D	B	7	8	6	B
21-C									

EdOS

EdOS

EdOS

EdOS

EdOS

EdOS

EdOS

EdOS