

8.SYMBOLS AND RULES SOLUTIONS

TEACHING TASK

JEE MAINS LEVEL QUESTIONS

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 (Mg) at its core.

2. Identify the elements present in the given compounds?

(i) CCl_4 (ii) NH_3 (iii) 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:

CCl_4 : Carbon (C) + Chlorine (Cl).

NH_3 : Nitrogen (N) + Hydrogen (H).

SO_2 : Sulphur (S) + Oxygen (O).

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 (C) with different atomic arrangements.

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 (Group 17, Halogens).

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) Symbol of Cobalt is "Co" (not "CO").

B) Symbol of Manganese is "Mn" (not "MN").

C) Incorrect. Symbols may not always be the first two letters (e.g., Gold = "Au" from Latin Aurum).

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), Ni (28), Co (27) → Incorrect (Co comes before Ni).

B) Sc (21), V (23), Ti (22) → Incorrect (Ti comes before V).

C) Pt (78), Au (79), Hg (80) → Correct order.

8. 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), Ni (28), Co (27) → Incorrect (Co is between Fe and Ni).

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

C) S (16), Ar (18), K (19) → Correct increasing sequence (skips Cl (17) but follows order).

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

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) Latin name: Wolfram (hence symbol "W").

B) Used as filament in bulbs due to high melting point.

C) Common name: Tungsten.

Multiple 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 (from Latin Hydrargyrum).

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

C) Potassium - K: Correct (from 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

Atomic number 50 = Tin

Symbol of Tin = Sn

Sb is the symbol for Antimony (atomic number 51)--->Incorrectly matched

B) 55 - Caesium - Ca

Atomic number 55 = Caesium -->Symbol of Caesium = Cs

Ca is the symbol for Calcium (atomic number 20)--->Incorrectly matched

C) 72 - Hafnium - Ha

Atomic number 72 = Hafnium

Symbol of Hafnium = Hf

Ha is not a valid element symbol----> Incorrectly matched

D) 71 - Lutetium - Lu

Atomic number 71 = Lutetium

Symbol = Lu ----->Correctly matched

Statement Type:

A) Both statement I and II are correct and statement II is correct explanation of statement I.

B) Both statement I and II are correct and statement II is not correct explanation of statement-I

C) Statement I is correct and statement II is incorrect.

D) Statement I is incorrect and statement II is correct.

12. Statement I : The symbol of Tungsten is W

Statement II : Its German name is wolfram

Answer:A

Solution: "W" comes from "Wolfram", its German name.

13. Statement I : For all elements their first letter indicates their symbols

Statement II : The symbol of Rubidium is Ru

Answer:E

Solution:Statement I: false.

Many symbols do not start with the first letter (e.g., Sodium = Na, Potassium = K, Iron = Fe).

Statement II: Incorrect

Rubidium's symbol is Rb, not Ru (Ru is Ruthenium).

Comprehension Type

Comprehension-I

An element is represented with the first letter in capital of the english name of the element. When the names of two or more elements begins with the same initial letter, the letter followed by the next letter is used to represent the element. if the symbol consists of two letters, the second letter is always a small letter. Some symbols derived from the first and the third letters of the names of the elements.

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:A) Argon - Ag:Incorrect.

Argon's symbol is Ar, while Ag is the symbol for Silver (from Latin Argentum).

B) Arsenic - Ar:Incorrect.

Arsenic's symbol is As, while Ar is the symbol for Argon.

C) Argentinum - Ar:Incorrect.

There is no element named "Argentinum." The Latin name for Silver is Argentum, with the symbol Ag.

Comprehension-II

Elements are arranged in the sequence of their atomic numbers according to the number of electrons or protons present in them.

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:A) Ca-17: Incorrect.

Calcium (Ca) has atomic number 20, not 17 (which is Chlorine, Cl).

B) I-54: Incorrect.

Iodine (I) has atomic number 53, not 54 (which is Xenon, Xe).

C) 74-Hf: Incorrect.

Atomic number 74 is Tungsten (W), not Hafnium (Hf, atomic number 72).

D) Hg-80: Correct.

Mercury (Hg) has atomic number 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).

A) Symbol Ta: Incorrect.

Ta is Tantalum (atomic number 73), not Titanium.

B) Preceding element Si: Incorrect.

The element preceding Ti (22) is Scandium (Sc, 21), not Silicon (Si, 14).

C) Succeeding element Vanadium: Correct.

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

D) All are correct: Incorrect (only C is correct).

Integer Type

17. The atomic number of an element which is used for uplifting balloons is_____

Answer:2

Solution: The gas used in balloons is Helium, because it is:Lighter than air
Non-flammable (safer than hydrogen)

Helium's atomic number = 2

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

Answer:9

Solution: The element responsible for fluorosis is Fluorine, due to excess fluoride in drinking water.Fluorine's atomic number = 9

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

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 chemical symbol system (e.g., H for Hydrogen, O for Oxygen).

2. The symbol of magnesium is

A) Mn B) Mg C) Na D) Mu

Answer:B

Solution:Magnesium's symbol is Mg (from its English 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 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 Latin Aurum (meaning gold).

5. Ag is the symbol for the element

A) Arsenic B) Gold C) Aluminium D)Silver

Answer:D

Solution:"Ag" is derived from Latin Argentum (meaning silver).

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

A) Tungsten and Tin B) Tinand Tungsten

C) Mercury and Tungsten D)Silver

Answer:C

Solution:Hydrargyrum → Mercury (Hg).

Wolfram → Tungsten (W).

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 identity (e.g., "O" for Oxygen).

Quantitative: Represents one atom (e.g., "O" = 1 atom of oxygen).

8. The symbol for the element Astatine is

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

Answer:B

Solution:Astatine's symbol is At (atomic number 85).

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 "K" comes from Latin Kalium. Others: Bohrium (Bh), Polonium (Po), and Uranium (U) are named after scientists/places, not Latin.

10. Which of the following is symbol of silver

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

Answer:A

Solution:Silver's symbol is Ag (from Latin Argentum).

JEE MAIN LEVEL QUESTIONS

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 correct symbol for carbon monoxide is CO (capitalized).

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 high thermal expansion and liquid state at room temperature.

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

A)Calcium B) Argon C) Tungston D)Carbon

Answer:A

Solution:Chalk is primarily calcium carbonate (CaCO_3), containing the metallic element Calcium (Ca).

4. Which of the following is used in pencils?

A) Carbon B) Silicon C) Charcoal D) Phoshorous

Answer:A

Solution:Pencil "lead" is made of graphite, a form of carbon (C).

5. W is the symbol of

A) Tin B) Antimony C) Tungstun D) Ferrus

Answer:C

Solution:Tungsten's symbol is W (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

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 is Latin for 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) is named after Ernest Lawrence.

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:58: Cerium (Ce).

71: Lutetium (Lu).

11. Which of the following are correct

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

Answer:D

Solution:Argon (Ar) → 18.

Krypton (Kr) → 36.

Xenon (Xe) → 54.

12. Which of the following is odd from others

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

Answer:B

Solution: Odd One Out is As Because it is a metalloid, while the others are either metals (Mg, Be) or a non-metal (Cl). It's also from Group 15, chemically very different.

ADVANCED LEVEL QUESTIONS

Multiple 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:A) Sodium → Symbol = Na → Latin name: Natrium

B) Potassium → Symbol = K → Latin name: Kalium

C) Iron → Symbol = Fe → Latin name: Ferrum

D) Mercury → Symbol = Hg → Latin name: Hydrargyrum

14. Which of the following is correct statement

A) The symbol of nobelium is Nb B) The symbol of bohrium is Bo

C) The symbol of Curium is Cm D) The symbol of Rutherfordium is Rf

Answer:C,D

Solution:A) The symbol of nobelium is Nb → Incorrect ? Nobelium = No, Nb = Niobium

B) The symbol of bohrium is Bo → Incorrect → Bohrium = Bh, Bo is not valid

C) The symbol of Curium is Cm → Correct: Curium = Cm

D) The symbol of Rutherfordium is Rf → Correct: Rutherfordium = Rf

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

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

Answer:C,D

Solution:The major elements present in the bones are Calcium and Phosphorus

Comprehension Type

An element is represented with the first letter in capital of the english name of the element. When the names of two or more elements begins with the same initial letter, the letter followed by the next letter is used to represent the element. If the symbol consists of two letters, the second letter is always a small letter. Some symbols derived from the first and the third letters of the names of the elements.

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

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

Answer:B

Solution:Thulium has the chemical symbol Tm (Atomic number 69)

The other options:

A) Tellurium → Te

C) Terbium → Tb

D) Technetium → 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), making up about 78% of the air.

Nitrogen's atomic number is 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.

Oxygen's atomic number is 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) forms countless stable compounds (organic chemistry) and exists freely in nature (e.g., graphite, diamond, CO₂).

Carbon's atomic number is 6.

Matrix Matching Type

20. 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 B) A-2,B-1,C-4,D-3
C) A-3,B-1,C-2,D-4 D) A-1,B-4,C-3,D-3

Column-II

- 1) Mendelevium
- 2) Natrium
- 3) Neptunium
- 4) Ruthenium

Answer:B

Solution:

- a) Elements with symbols derived from latin name 2) Natrium
- b) Elements named after scientists 1) Mendelevium
- c) Elements named after countries 4) Ruthenium
- d) Elements named after planets 3) Neptunium

21.

Symbol

Element

- A) Hg 1) Potassium
- B) K 2) Gold
- C) Sn 3) Lead
- D) Au 4) Tin
- E) Pb 5) Mercury

- A) A-1, B- 2, C-3, D-4,E-5 B) A-5,B-1,C- 2,D-4,E-3
C) A-5, B-1, C-4, D-2, E-3 D) A-5,B-1,C- 3,D-2,E-4

Answer:C

Solution:

- A) Hg 5) Mercury
- B) K 1) Potassium
- C) Sn 4) Tin
- D) Au 2) Gold
- E) Pb 3) Lead

KEY

				TEACHING TASK					
1	2	3	4	5	6	7	8	9	10
B	B	D	D	D	D	C	C	D	A,C,D
11	12	13	14	15	16	17	18		
A,B,C	A	E	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 LEVEL QUESTIONS					
1	2	3	4	5	6	7	8	9	10
A,C	B	A	A	C	D	C	B	C	D
11	12								
D	B								
				ADVANCED LEVEL QUESTIONS					
13	14	15	16	17	18	19	20	21	
A,B,C,D	C,D	C,D	B	7	8	6	B	C	