STURUCTURE OF ATOM

LEARNING OBJECTIVES:

- Simple structure of an atom
- Fundamental particles
- Atomic number and Mass number
- Geometrical structures
- Electronic configuration
- Periodic table

Real Life Applications :

Φ In the most simple terms, without atoms there would not be a functioning world. Atoms make up matter, and matter makes up everything in the world,with a few exceptions. Here are some examples of how atoms affect the world:

Φ Oxygen atoms are in the air and keep up alive because we need oxygen in order to breathe.

Φ Carbon dioxide atoms are released from our bodies and plants take in the CO_2 so that they can photosynthesize

§§ **Introduction:**

Let us suppose that we have an element, say gold. If we have a small piece of gold and we start grinding it, will break into very fine particles which cannot be further sub devided. In a way we will reach a stage when gold particles cannot be further subdevided.

The smallest particle of gold will still possess the properties of gold. More over, if gold undergoes chemical change, then this change must start from the smallest particle. This smallest particle of an element is called "Atom". The term atom comes from the Greek language meaning indivisible.

§§ **Definition:**

The smallest particle of an element, which may (or) may not have independent existence, but always takes part in a chemical reaction is called an atom.

Eg:Hydrogen ,Helium, carbon etc

§§ **Simple structure of an atom :**

Atom is the smallest particle which may exist (or) may not be exists independently regarding all the properties of matter.

§§ **Maharshikanad views of atom:** In Vedic period, Maharshi Kanad demonstrated,that matter is made up of tiny particles named as paramanu .(In sanskrit,param means final or ultimate and anu means particle.).Kanad further said that two or more paramanus combine to form bigger particles known as Anu.

Democritus proposed that matter is made up of extremely small particles called 'atomos' which means indivisible.

An atom essentially consists of 2 parts: i) Nucleus ii) electron.

§§ **Nucleus:**

A) It is the central region of an atom or The positive region of the atom is concentrated in the small dense portion , called Nucleus.Almost the entire mass of an atom is concentrated in the nucleus.

1911, Rutherford performed a brilliant experiment and discovered the Nucleus.

Imagine an atom is magnified to the size of a sphere having a diameter equal to the cricket field. If you imagine a cricket ball equal to the size of nucleus placed with in the sphere then the first electron revolving around the sphere will be at the boundary.

In other words, the size of nucleus is extremely small as compared to the total volume of an atom. Thus even with in the atom there is vast empty space. The diameter of nucleus of an atom is 10,000 times smaller than the diameter of atom.

B) atoms are composed of negatively charged electrons ,positively charged protons and electrically neutral neutrons

C) the protons and neutrons are colletively called nucleons .located in a small region known as nucleus

D) the electrons are revolves around the nuleus in an orbits or shells

§§ **Characteristics of Proton:**

i) Proton was discovered by Goldstein. Later Goldstein proved the presence of positively charged particles with in the atom by a brilliant experiment. Furthermore it wasfound that its mass is almost equal to mass of one atom of hydrogen. It was named as proton.

ii) It is denoted by the symbol ${}^{1}_{+1}P$, +1 denotes its charge,

iii) The mass of one proton is taken as 1 amu (atomic mass unit). The charge on proton is taken as unit positive charge.

iv) The proton is held with in the nucleus. It is the number of protons present with in the nucleus which distinguish atoms of one element from the other elements.

For example, if the number of protons with in the nucleus is only one, the atom is of element Hydrogen. However, if nucleus has 2 protons, the atom is of element Helium.

§§ **Characteristics of Neutron**:

i) In 1932, James Chadwick discovered neutron.It is denoted by the symbol ${}_{o}n^{1}$.Where"0" denotes its charge and "1" denotes its mass .

ii) Further researches have proved that with in the atom are present different kinds of sub-atomic particles like positron, meson,neutrino.

§§ **Characteristics of Electron:**

i) J.J. Thomson was a brilliant English Scientist who did research in conduction of electric current through gases at low pressure. During this research, he discovered a particle which was electrically charged and has mass equal to $\frac{1}{1837}$ times the mass of one atom of hydrogen.

ii) Hence it is neligible the charge on this particle was negetive. He named this particle as electron.

iii) It is denoted by the symbol ${}^{0}_{-1}e$. Where "0" denotes its mass and -1 denotes its charge an electron regarded weightless.It has no electric change on it. Its mass is almost equal to mass of one atom of hydrogen.

TEACHING TASK

I. Single answer type questions

1. A negatively charged particle, in an atom, with a negligible mass
A) electron B) Neutron C) Nucleus D) None.

2. The central core of an atom
A) Neutrino B) Meson C) Nucleus D) electron

3. Neutron was discovered by
A) Bohr B) Gold stein C) J.J. Thomson D) Chadwick

4. The idea of 'Anu' and 'paramanu' was introduced by
A) Democritus B) John Dalton

C) Willam Crookes D) Maharisha Kanada

5. The term 'atom' was given by
A) Democritus B) John Dalton
C) Willam Crookes D) Maharisha Kanada

6. How many protons are present in Helium
A) 2 B) 4 C) 3 D) 6

7. How many protons are present in Flourine
A) 7 B) 9 C) 11 D) None.

8. Proton was discovered by
A) Gold Stein B) J.J . Thomson C) Chadwick D) None.

II. Multi correct type questions

◆ *This section contains multiple choice questions. Each question has 4 choices (A), (B), (C),(D), out of which* ***ONE or MORE*** *is correct. Choose the correct options*

9. The discovery of an electron and the named kept by
A) J.J. Thomson B) Chadwick C) Stoney. D) None of the above

10. Which of the following is/are correct
A) electron has unit negative charge B) Proton has unit positive charge
C) Neutron has no charge D) None of the above

III. Odd one out type

11. A) Electron B) Meson C)Proton D)Neutron.

IV. True or False type

12. The smallest unit of an element is called a paramanu.

13. Chadwick discovered the electron

14. A proton is $^{1}/_{1837}$ times heavier than an electron.

V. Matching type

◆ *This section contains Matrix-Match Type questions. Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in* ***Column–I*** *have to be matched with statements (p, q, r, s) in* ***Column–II****. The answers to these questions have to be appropriately bubbled as illustrated in the following example.*

*If the correct matches are A-p,A-s,B-r,B-r,C-p,C-q and D-s,then the correct bubbled 4*4 matrix should be as follows:*

15.

a) A subatomic particle with in an atom	1) proton
b) The central core of an atom	2) nucleus
c) Symbolic representation of one molecule	3) formula
d) Nucleons	4) protons, neutrons

A) a - 3, b - 4, c - 2, d - 1 B) a - 4, b - 3, c - 2, d - 1
C) a - 1, b - 2, c - 3, d - 4 D) a - 2, b - 4, c - 3, d - 1

LEARNER'S TASK

BEGINNERS (Level - I)

Single answer type questions

1. Nucleus was discovered by
A) Rutherford B) Chadwick C) Anderson D)Thomson

2. Nucleons are
A) Only neutrons B) Only protons
C) both protons and neutrons D) electrons, protons and neutron.

3. Fundamental particle unstable outside the nucleus is
A) Electron B) Proton C) Neutron D) Positron.

4. Number of protons in the nucleus of carbon atom is
A) 7 B) 6 C) 2 D) 5

5. A sub atomic particle with in an atom, which is neutral in character
A) Neutron B) Electron C) Positron D) Proton

6. The particle with greatest mass is
A) Neutrino B) Neutron C) Proton D) Positron.

7. The total number of fundamental particles of normal carbon atom
A) 6 B) 12 C) 18 D) 24

8. Protons are denoted by the symbol
A) P^0 B) P^{-2} C) $_{+1}p^1$ D) None

9. Neutrons are
A) Electrically Neutral B) Positively charged C) Negatively Charged D) None

ACHIEVERS (Level - II)

Descriptive type questions

10. Why is an atom electrically neutral ?

11. Why do the negetively charged electrons not fall in to the nucleus ?

EXPLORERS (Level - III)

Multi answer type questions

◆ *This section contains multiple choice questions. Each question has 4 choices (A), (B), (C),(D),out of which **ONE or MORE** is correct. Choose the correct options*

12. Identify the incorrect statement in the following
A) Mass of neutron is same as the mass of the proton
B) Neutron is the lightest particle of the atom
C) Neutrons are present out side of the nucleus.
D) Neutron has neutrol charge

13. Nucleons are
A) the fundamental particles present in the atomic nucleus
B) the protons present in the atomic nucleus
C) Protons and neutrons present in the nucleus
D) the particles emitted in radio activity

Odd One Out type

14. A)Chadwick B) Thomson C) Goldstein D)C.V Raman.

15. A) Positron B) Nutrino C) Meason D) Plasma

True or False type

16. Neutron is a negetively charged particle.

17. The core of an atom is called Nucleus.

Matching type

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*If the correct matches are A-p,A-s,B-r,B-r,C-p,C-q and D-s,then the correct bubbled 4*4 matrix should be as follows:*

18.

a) Chadwick	A) electron
b) Gold Stein	B) Nucleus
c) Ruther Ford	C) Proton

d) J.J. Thomson D) Neutron
A) a - 3, b - 4, c - 2, d - 1 B) a - 4, b - 3, c - 2, d - 1
C) a - 2, b - 1, c - 4, d - 3 D) a - 2, b - 4, c - 3, d - 1

HIGH ORDER THINKING SKILLS

19. An atom is the smallest unit of an element which takes in a
A) chemical reaction B) physical reaction
C) condensation reaction D) None.

20. The mass of one proton is taken as
A) Atomic mass unit B) cm^{-1} C) cm/sec D) cm.

21. A positively charged particle, with in an atom
A) Proton B) Meson C) Electron D) None

22. The diameter of nucleus of an atom is ..times smaller than the diameter of atom
A) 25,000 B) 10,000 C) 15,000 D) 21,000.

23. While discovering the electron J.J Thomson passes the electric current through?
A) Low Pressure B) High Pressure C) Low Temperautre D) High Temperature

KEY

ΦΦ TEACHING TASK

1-A, 2-C, 3-D 4-D 5-A 6-A 7-B 8-A 9-A,C 10-A,B,C
11.Meson 12. True 13. False 14. True 15- c

ΦΦ LEARNER'STASK :

☐ **BEGINNERS :**

1.A 2.C 3. A 4.B 5. A 6. C 7. C, 8. C, 9. A

☐ **EXPLORERS :**

12. B,C 13.A,C,D 14. D 15.D 16. F 17.T 18. B 19.A 20. A
21.A 22.B 23.A

§§ Geometrical Structure:

Electrons revolve round the neucleus only in certain permissible circular orbits also called Shells.

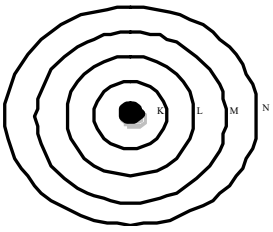
Distribution of electrons revolving around the nucleus of an atom. in different orbits is called electronic configuration. It is proposed by Bohr and Bury.

The orbit nearest to the neucleus is counted as the first (n = 1)and is called K shell.The subsequent orbits i.e the second third, fourth, fifth, etc. Orbits are called the L, M, N & O respectively.

The maximum no.of electrons which can be present in any shell of an atom is given by the formula $2n^2$.

The outermost shell cannot have more than 8 electrons and the next shell it cannot have more than 18 electrons.

An atom becomes stable. When its outer most shell has 8 electrons (or) it has only one shell containing 2 electrons.



Eg : $_{6}C^{12}$ 12 $\rightarrow$ Mass number
6 $\rightarrow$ Atomic number

Maximum number of electrons in different energy levels.

Shell number (or) energy level	Maximum no.of electrons
First shell (or) K - shell	$2(n)^2 = 2(1)^2 = 2$
Second shell (or) L - shell	$2(n)^2 = 2(B)^2 = 8$
Third shell (or) M - shell	$2(n)^2 = 2(C)^2 = 18$
Fourth shell (or) N - shell	$2(n)^2 = 2(D)^2 = 32$

§§ **Atomic number:**

The no.of protons in the nucleus of an atom is called atomic number there fore the no.of e^- revolving around the nucleus is equal to the atomic number.

Ex: $_{13}Al^{27}$

i) It is an atom of aluminium Atomic no.of aluminium is 13.

§§ **Mass number:**

The total number of protons and Neutrons present in the nucleus of an atom is called mass number (or) atomic mass.

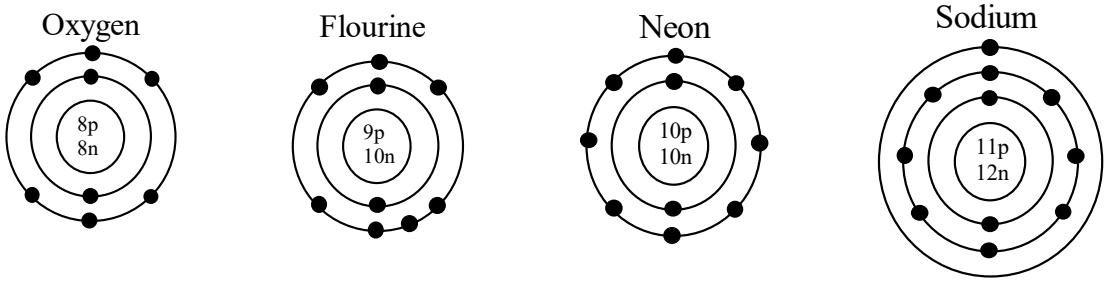
Ex : $_{13}Al^{27}$ 27 $\rightarrow$ Mass number
13 $\rightarrow$ Number of neutrons = Mass number - Atomic number A - Z.

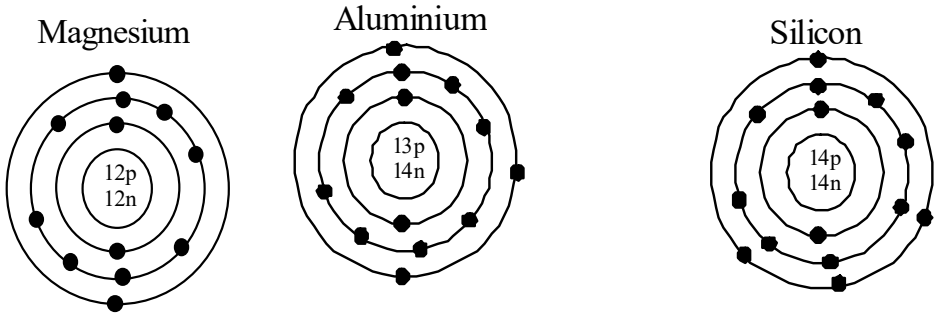
Mass number of Aluminium is 27

§§ **Geometric Representation of elements.**

Element	Electrons orbit wise	No.of Neutron	No.of Protons	No.of electrons
Hydrogen	1	1 - 1 = 0	1	1
Helium	2	4 - 2 = 2	2	2
Lithium	2,1	7 - 3 = 4	3	3
Beryllium	2,2	9-4 = 5	4	4
Boron	2,3	11-5 = 6	5	5
Carbon	2,4	12 - 6 = 6	6	6
Nitrogen	2,5	14 - 7 = 7	7	7
Oxygen	2,6	16 - 8 = 8	8	8

§§ **Geometrical representation:**





TEACHING TASK

Single answer type questions

1. Geometrical structure proposed by
A) Goldstein B) Chadwick C) Bohr D) Bohr and Bury.

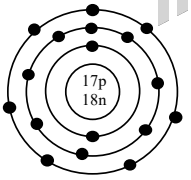
2. The maximum no.of electrons in L shell are
A) 2 B) 18 C) 32 D) 8

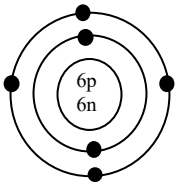
3. The outermost shell of an atom cannot have more than
A) $2e^-$ B) $8e^-$ C) $18e^-$ D) $32e^-$

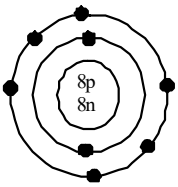
4. The maximum no.of electrons in N shell are
A) 8 B) 32 C) 18 D) 10

5. $^{24}_{12}mg$ here what is the mass number
A) 12 B) 24 C) 14 D) None.

6. Geometric conf^n of chlorine atom

A) 

B) 

C) 

D)None

7. The no.of neutrons in the nucleus of an atom can be calculated by
A) A - Z B) Z - A C) A + Z D) Z + A

8. The K - shell of any atom cannot have more than ..... electrons
A) $8e^-$ B) $32e^-$ C) $2e^-$ D) $18e^-$

9. How many valence electrons present in Argon
A) 2 B) 8 C) 10 D) 6

10. Here $^{40}_{20}P$ what is the mass number
A) 40 B) 20 C) 14 D) 27

11. The maximum no.of electrons in any shell of an atom is given by the formula
A) n B) $2n^2$ C) 2n D) $4n^2$

12. The only noble gas which has two and only two electrons in its valence shell
A) Ne B) He C) Ar D) Xe.

13. $^{27}_{13}Al$ has
A) 13 electrons + 13 protons + 14 neutrons

B) 13 electrons + 14 protons + 13 neutrons
C) 10 electrons + 13 protons + 14 neutrons
D) 12 electrons + 10 protons + 12 neutrons.

Multi Answer Type Questions

♦ *This section contains multiple choice questions. Each question has 4 choices (A), (B), (C),(D), out of which **ONE or MORE** is correct. Choose the correct options*

14. Choose the correct statement
A) There are 20 protons in calcium atom
B) there 8 electrons in the oxygen atom
C) there are 6 electrons in carbon atom
D) there are 12 protons in hydrogen atom

Odd One Out type

15. A)K - shell, B) $2n^2$, C)L - shell, D) M - shell, E)N - shell.

True or false type

16. Neon is the only gas which has 2 electron in its valence shell.
17. L - shell of an atom can have a maximum of 18 electrons.

Matching type

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*If the correct matches are A-p,A-s,B-r,B-r,C-p,C-q and D-s,then the correct bubbled 4*4 matrix should be as follows:*

18.

Shell number (or) energy level	**Maximum no.of electrons**
a) First shell (or) K - shell	1) 2
b) Second shell (or) L - shell	2) 18
c) Third shell (or) M - shell	3) 8
d) Fourth shell (or) N - shell	4) 32

A) a - 3, b - 4, c - 2, d - 1 B) a - 1, b - 3, c - 2, d - 4
C) a - 2, b - 1, c - 4, d - 3 D) a - 2, b - 4, c - 3, d - 1

LEARNER'S TASK

BEGINNERS (Level - I)

Single Answer Type Questions

1. $_{11}Na^{23}$ has
A) 11 electrons + 12 protons B) 11 protons + 12 neutrons
C) 11 electrons + 11 protons + 12 neutrons D) 11 protons + 11 neutrons.

2. Neutrons are absent in
A) Helium B) Carbon C) Hydrogen D) Boron.

3. Mass number of atom represents the number of
A) Protons only B) protons & neutrons
C) protons & electrons D)neutrons and electrons

4. Bohr model was given by
A) Neils bohr B) John Dalton C)Rutherford D) James Chadwick

5. The orbit nearest to nucleus is
A) K shell B) L shell C) M shell D) N shell

6. The first, second, third & fourth orbits are respectively designated as
A) A, B,C,D B) P,Q,R,S C) K,L,M,N D) S,P,D,F

7. If n = 3, the corresponding shell is
A) K B)L C)M D)N

8. How many neutrons present in $^{20}_{10}Ne$
A) 10 B) 20 C) 5 D) 15

9. H^+ represents
A) Proton B) Meson C) Neutron D) Electron

10. Negetive charged particles called as
A) positrons B) electrons C) Proton D) None.

11. The name electron was kept by
A) Stoney B) J.J. Thomson C) GoldStein D) Chadwick.

12. Smallest Particle of a matter
A) Anu B) Paramanu C) Atom D) Kana.

13. In carbon how many protons
A) 6 B) 5 C) 12 D) 4

14. Atomic number of Aluminium
A) 13 B) 15 C) 10 D) 11

15. What is the mass number of Tritium
A) 1 B) 3 C) 2 D) None.`

16. Representation of an neutral atom which contains 8 electrons and 9 neutrons is
A) $_8X^9$ B) $_9X^8$ C) $_9X^{17}$ D) $_8X^{17}$

ACHIEVERS (Level - II)

Descriptive Type Questions :

17. Write the geometrical representation of Calcium ?

18. Write the electronic configuration of Argon ?

EXPLORERS (Level - III)

Multi Answer Type Questions

*This section contains multiple choice questions. Each question has 4 choices (A), (B), (C),(D), out of which **ONE or MORE** is correct. Choose the correct options*

19. The circular paths in which the electrons revolve are called
A) orbit B) shells C) main energy levels D) none

Odd one out .

20. A)Chemical equation, B) Reactants, C) Products, D) Neutron.

21. A)2, B) 8, C) 18, D) 4

True (or) False:

22. Argon is the example of a noble gas.

23. $^{12}_6C$ denotes that element carbon has mass number 6 and atomic number 12.

Matching

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*If the correct matches are A-p,A-s,B-r,B-r,C-p,C-q and D-s,then the correct bubbled 4*4 matrix*

should be as follows:

24.

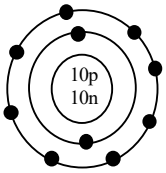
Column I	Column II
a. Hydrogen	1. $1s^1$
b. Heluim	2. $1s^2\ 2s^1$
c. Lithium	3. $1s^2\ 2s^2\ 2p^2$
d. Carbon	4. $1s^2$

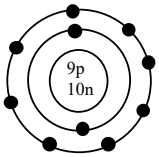
A) a - 3, b - 4, c - 2, d - 1 B) a - 1, b - 3, c - 2, d - 4
C) a - 2, b - 1, c - 4, d - 3 D) a - 1, b - 4, c - 2, d - 3

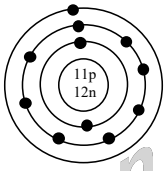
HIGHER ORDER THINKING SKILLS

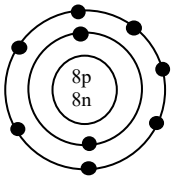
25. The no.of protons in the nucleus of an atom is called
A) Mass number B) Atomic number C) valency D) Radical

26. Geometric conf ^{n} of sodium atom

A) 

B) 

C) 

D) 

27. Electrons revolve around nucleus only in certain permissible ---------
A) elliptical orbits B) square orbits C) circular orbits D) None

28. The maximum number of electrons in N shell are
A) 2 B) 18 C) 32 D) 8

29. Neutron number in 'Ca'
A) 20 B)21 C)40 D) 19

KEY

ΦΦ TEACHING TASK :

1.D 2.D 3.B 4.B 5. B 6.A 7. A 8. C 9. B 10.A 11. B 12.B
13.A 14. A,B,C 15. B 16. F 17. F 18. B

ΦΦ LEARNER'STASK :

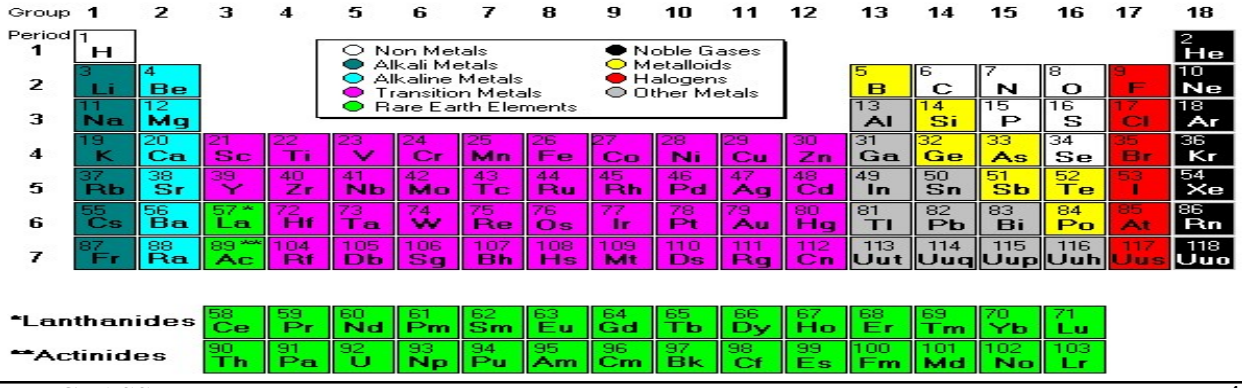
☐ **BEGINNERS :**

1-A 2-C 3- B 4-A 5-A 6-C 7-C 8-A 9-A 10-B 11. A
12.B 13. A 14. A 15.B 16. D

☐ **EXPLORERS :**

19. A,B 20. D 21. D 22.T 23.T 24.D 25-B 26 -C
27-C 28-C 29-A

PERIODIC TABLE



§§ **Origin of the periodic table :**

The periodic table provides a means of organising information so that relationship among the elements can be clearly seen and understood.

1.Periodic table is an arrangement of elements with similar properties placed together.

2.Elements have been arranged in the order of incresing atomic number.

§§ **Terminology in periodic table:**

Periods: The horizontal rows are called as periods .

There are seven periods in periodic table.

Each period starts with **s-block** and ends with **p-block.**

Groups: The vertical coloumns are known as groups.

There are eighteen groups in periodic table.

each group will follows magic numbers(2,8,8,18,18 & 3B)

§§ **Modern periodic law:**

"The physical and chemical properties of elements are the periodic functions of their atomic numbers"

Blocks: Periodic table is divided into four blocks.They are

1. s-block 2. p-block 3. d-block 4. f-block.

§§ **Types of elements:**

1.Representative elements

2.Transition elements

3.Inner Transition elements

4.Noble gas elements

§§ **Lanthanides and Actinides:**

The elements placed in two separate rows at the bottom of the periodic table are called as Lanthanides and Actinides.

TEACHING TASK

Single Answer Type Questions

1. The elements which are malleable, ductile and good conductors of heat and electricity are named as:

A) Non-metals B) Metals C) Metalloids D) None

2. The elements which are brittle, bad conductors of heat and electricity are named as:

A) Non-metals B) Metals C) Metalloids D) None

3. The elements posses both metallic and non metallic characteristics are named as:

A) Non-metals B) Metals C) Metalloids D) None

4. The number of periods present in long form of periodic table are

A) 1 B) 4 C) 8 D) 7

Multi answer type questions

♦ *This section contains multiple choice questions. Each question has 4 choices (A), (B), (C),(D),out of which* ***ONE or MORE*** *is correct. Choose the correct options*

5. Which of the following elements belongs to same group

A) Be B) Mg C) Ca D) He

6. Which of the following elements belongs to same period

A) Be B) B C) C D) He

Odd One Out

7. He, H_2, O_2, Br_2

8. He, Ne, Ar, Na

True or False

9. Sulphur is a metallic element.

10. The physical state of mercury is liquid.

Matching

♦ *This section contains Matrix-Match Type questions. Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in **Column–I** have to be matched with statements (p, q, r, s) in **Column–II**. The answers to these questions have to be appropriately bubbled as illustrated in the following example.*

*If the correct matches are A-p,A-s,B-r,B-r,C-p,C-q and D-s,then the correct bubbled 4*4 matrix should be as follows:*

11.

A) Sodium	1) 2
B) Magnesium	2) 1
C) Aluminium	3) 4
D) Silicon	4) 3

A) a - 3, b - 4, c - 2, d - 1 B) a - 1, b - 3, c - 2, d - 4

C) a - 2, b - 1, c - 4, d - 3 D) a - 2, b - 1, c -4 , d - 3

LEARNER'S TASK - I

BEGINNERS (Level - I)

Single answer type questions

1. The number of groups present in long form of periodic table are

A) 4 B) 5 C) 8 D) 18

2. Nobel gases are present in which group

A) 4 B) 2 C)18 D) 1

3. The atomic number of oxygen is

A) 2 B) 4 C)6 D) 8

4. The element whose atomic number is 15

A) Boran B) Oxygen C) Phosphorus D)Sulphur

ACHIEVERS (Level - II)

Descriptive Questions :

5. What are the elements present in Alkaline earth metals ?

6. Explain groups and periods ?

7. What are Lanthanides and Actinides ?

EXPLORERS (Level - III)

Multi answer type questions

♦ *This section contains multiple choice questions. Each question has 4 choices (A), (B), (C),(D), out of which **ONE or MORE** is correct. Choose the correct options*

8. Which of the following elements are metals

A) Na B) Li C) Al D) P

9. Which of the following elements contain same valency electrons

A) O B) S C) Na D) Mg

Odd One Out

10. Li, Be, B, S

11. O_2, N_2, H_2, O_3

True or False

12. Sodium is a alkali metal

13. Helium is a VIII A metal

Matching

♦ *This section contains Matrix-Match Type questions. Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in* ***Column–I*** *have to be matched with statements (p, q, r, s) in* ***Column–II****. The answers to these questions have to be appropriately bubbled as illustrated in the following example.*

*If the correct matches are A-p,A-s,B-r,B-r,C-p,C-q and D-s,then the correct bubbled 4*4 matrix should be as follows:*

14.

Column I	Column II
a. C	1. VI A
b. O	2. IV A
c. Be	3. VII A
d. F	4. II A

A) a - 3, b - 4, c - 2, d - 1 B) a - 1, b - 3, c - 2, d - 4

C) a - 2, b - 1, c - 4, d - 3 D) a - 2, b - 4, c - 3, d - 1

HIGHER ORDER THINKING SKILLS

15. According to the modern periodic law the physical & chemical properties of an elements are periodic functions of their?

A) Atomic mass B). Atomicnumber C) Proton Number D) Neutron Number

16. Verical coloumns are known as

A) Periods B) Groups C) Line D) Block

LEARNER'S TASK - II

BEGINNERS

MCQ single answer type

1. The horizantal rows in periodic table is called

A) Periods B) Groups C) Blocks D) Lines

2. The atoimic number is represented with alphebetical letter?

A) A B) Z C) N D) F

3. Charge of electron is ?

A) I unit possitive B) I unit negative C) Zero D) 2 Units negaive

4. If the atom want to get stablity how many electrons it should in its outer shell?

A) 9e B)10e C) 8e D) 18e

EXPLORERS

Multi answer type

♦ *This section contains multiple choice questions. Each question has 4 choices (A), (B), (C),(D),out of which* ***ONE or MORE*** *is correct. Choose the correct options*

5. f- block consisting with ?

A) Lanthanoids B) Actinids C) Representative elements D) Nobel gases

6. Types of elements?

A) Representative B) Transition C) Inner Transition D) Nobel Gas

Odd one out

7. Li, Na, K, Be

8. 2,8,18,32,38

True or false

9. In Perriodic table elements are arranged in increasing order of their atomic weight.

10. Argon is having 8 electrons in outer shell

Matching

♦ *This section contains Matrix-Match Type questions. Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in* ***Column–I*** *have to be matched with statements (p, q, r, s) in* ***Column–II****. The answers to these questions have to be appropriately bubbled as illustrated in the following example.*

*If the correct matches are A-p,A-s,B-r,B-r,C-p,C-q and D-s,then the correct bubbled 4*4 matrix should be as follows:*

11.

a) Proton	A) $2n^2$
b) Neutron	B) $_{-1}e^0$
c) electron	C) ^1_1P
d) formula	D) ^1_0n

A) a - 3, b - 4, c - 2, d - 1 B) a - 4, b - 3, c - 2, d - 1
C) a - 2, b - 1, c - 4, d - 3 D) a - 2, b - 4, c - 3, d - 1

HOTS

12. Noble gas are stable and they are not involving in any chemical reaction because
A)They hav octate configuration in outer shell.
B)They arew more reactive
C)They are arrangend at last in the periodic table.
D)None

13. General electronic conifiguration of nobel gases
A)$ns^2np^6nd^{10}$ B)ns^2np^6
C)$ns^2\ np^5$ D)$ns^2\ np^4$

14. Mass of electron
A)$9.10938x10^{-31}$ kg B)1.007276 amu
C)$1.6022x10^{-19}$ c D)1.0086654amu

15. The number of orbitals in M shell
A)1 B)2 C)3 D)4

KEY

ΦΦ TEACHING TASK :

1.B 2.A 3.C 4.D 5.A,B,C 6.A,B,C 7.He 8.Na 9.F 10.T 11.D

ΦΦ LEARNER'STASK - I:

☐ **BEGINNERS :** 1-D 2-C 3-D 4-C

☐ **EXPLORERS :** 8. A,B,C 9. A,B 10.S 11.O_3 12.T 13. F 14.C 15.B 16.B

ΦΦ LEARNER'STASK - II :

☐ **BEGINNERS :** 1. A 2.A 3.B 4.D

☐ **EXPLORERS :** 5. A,B 6. A,B,C 7.Be 8.38 9. F 10.T 11.A 12.A 13.B 14.A 15.C