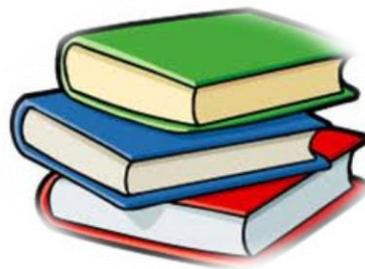


# Chemistry

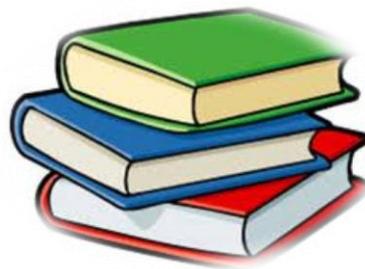


## Chapter One

### 1-Write the scientific term:-

- 1- The amount of energy absorbed or emitted when an electron is transferred from an energy level to another.      **(Quantum)**
- 2- Electrons occupy the sublevels in the Order of increasing their energy, the lowest is filled first      **(Auf bau principle)**
- 3-The electron is a (-ve) particle with waves properties.      **(Dual nature of the electron)**
- 4- No electron pairing takes place in a given sublevel until each orbital contains one electron.      **(Hund's rule)**
- 5- The number that defines the orbitals of a given energy sublevel.      **(Magnetic Quantum no.)**
- 6- The determination of both velocity and the position of an electron at the same time is practically impossible      **(un certainty principle)**
- 7- A limited number of colored lines that is characterized for each element.      **(Spectral lines)**
- 8- The electron which gains energy and transfers to higher energy level.      **(Excited electrons)**
- 9- The region of the space around the nucleus which has a great probability of finding the electrons.      **(Orbital)**
- 10- A pure simple substance that can't be changed into simpler form by traditional chemical method.      **(Element)**
- 11- The no. that defines the spin motion of electron around its axis      **(Spin quantum number)**

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12- The no. that defines the sublevels in a given principal energy level  
(Subsidiary quantum number)

## **2- Write the name of the scientist (s) or 1<sup>st</sup> one who:-**

1- Stated that all matters composed of four components water, air, dust and fire with different ratios. (Aristotle)

2- Named the smallest part of matter: the atom

(Greek philosophies)

3- Discovered the cathode rays (Thomson)

4- Rejected the concept of the atom (Aristotle)

5- Discovered the nucleus of the atom (Rutherford)

6- Described the atom as a sphere of a uniform positive electricity  
(Thomson)

7- Explained the hydrogen atom spectra (Bohr)

10 – Defined the element as a pure simple substance (Boyle)

11- Solve the wave equation (Schrodinger)

## **3- Give reason: -**

**1- Zinc sulphide is used Rutherford's experiment**

To glow at the site of collision with  $\alpha$ - particles.

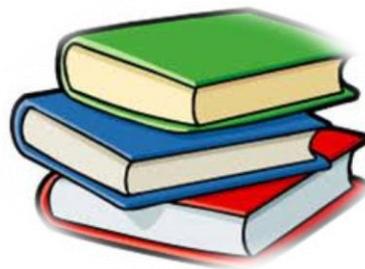
**2- The sublevel ( p) is saturated by 6 electrons .**

**Bec.** It consists of 3 orbital's ( $2 \times 3 = 6 e^-$ )

**3- It is not correct to consider the electron as a negative particle only**

**Bec:** it has wave properties.

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4- The electrons prefer to be paired than to be single in the higher energy level.

**Bec.** : This gives the atom more stability.

5- The matter waves are different from the moving body and their speed  $\neq$  that of electromagnetic waves.

**Bec.** : They are not separated from the moving body and their speed  $\neq$  that of the electromagnetic waves.

6- The electron has a dual nature.

**Bec.** : The electron is a material particle which has wave properties.

**4- Write: the probability of four quantum numbers of the last electron for the following:**

1)  ${}_5\text{B}$        $1\text{S}^2, 2\text{S}^2, 2\text{P}^1$

| n | L | $m_l$ | $m_s$          |
|---|---|-------|----------------|
| 2 | 1 | -1    | $+\frac{1}{2}$ |

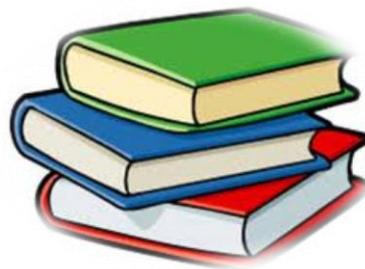
2)  ${}_9\text{F}$        $1\text{S}^2, 2\text{S}^2, 2\text{P}^5$

| n | L | $m_l$ | $m_s$          |
|---|---|-------|----------------|
| 2 | 1 | +1    | $+\frac{1}{2}$ |

3)  ${}_{11}\text{Na}$        $1\text{S}^2, 2\text{S}^2, 2\text{P}^6, 3\text{S}^1$

| n | L | $m_l$ | $m_s$          |
|---|---|-------|----------------|
| 3 | 0 | 0     | $+\frac{1}{2}$ |

# Chemistry



## 5- Choose the Correct answer:-

1- The no. of energy sublevels in the principal energy level (n) equals

- a-  $n^2$       b-  $2n^2$       c- n      d-  $(2n)^2$

2- The no. of orbitals in a given sublevel (n) equals

- a-  $n^2$       b-  $2n^2$       c- n      d-  $(2n)^2$

3- The sublevels of an energy level are

- a- Equal in energy      b- nearly equal in energy  
c- different in energy      d- different in energy and shape