TGT/PGT
CHEMISTRY
Revision Book

Importent Facts, Formulas & Oneliners
Chapter, Topic & Subtopic Wise

Useful for : TGT/PGT/LT-GRADE/NVS/KVS/DSSSB/GIC/GDC/Assistant Professor EMRS/AWES/DIET/AEES and Other Competitive Exam

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PHYSICAL CHEMISTRY

ORGANIC CHEMISTRY

1. PHYSICAL CHEMISTRY
Some Basic Concepts of Chemistry

Uncertainty in Measurement

- The number of significant figures in value 5.041 is– **4**
- Express the result of (0.582 + 324.65) to the appropriate number of significant figures– **325.23**
- The number of significant figures in value of π are– ∞
- The correctly reported answer of the addition of 29.4406, 3.2 and 2.25 will have significant figures-**3**

Law's of Chemical Combinations

- The law of conservation of mass can not holds good for.– **Nuclear reaction**
- Hydrogen and oxygen combine to form H_2O_2 and H_2O containing 5.93% and 11.2% hydrogen respectively, the data illustrates– **Law of multiple proportions**
- 36 g of carbon combines with 32 g of oxygen to form 68 g of CO_2 this best explains-
- Atoms combine in the ratio of small whole numbers to form compounds. This explains- **Law of multiple proportion**
- 12 g of carbon combines with 32 g of oxygen to form 44 g of CO_2 this best explains- **Law of conservation of mass**
- The pairs of compounds $SnCl_2$, $SnCl_4$ illustrates- **Law of multiple proportions -99**

Atomic and Molecular Masses, Mole Concept Molar Masses, Empirical & Molecular Formula

- The molecular mass of glucose ($C_6H_{12}O_6$)– **180.162 u**
- 1 g-atom of nitrogen represents–**11.2 L of N_2 at S.T.P**
- The number of oxygen atoms present in 14.6 g of magnesium bicarbonate is– **0.6 N_A**
- If N_A is Avogadro's number, then the number of oxygen atoms in one g-eqivalent of oxygen is– **$N_A/2$**
- 7.5 grams of a gas occupy 5.8 litres of volume at STP, the gas is– **NO**
- Number of Ca^{+2} and Cl^{-} ion in 111 g of anhydrous $CaCl_2$ are– **N_A, $2N_A$**
- The maximum volume at N.T.P. is occupied by– **1 gm-molecule of CO_2**
- 23g of sodium will react with ethyl alcohol to give– **1/2 mole of H_2**
- One mole of nitrogen gas has volume equal to– **22.4 litre of nitrogen at S.T.P.**
- An element A (at wt = 75) and another element B (at. wt. = 25) combine to form a compound. The compound contains 75% A by weight. The formula of the compound will be– **AB**
- 60 g of a compound on analysis gave 24 g C, 4g H and 32 g O. The empirical formula of the compound is– **CH_2O**
- An oxide of a metal (M) contains 40% by mass of oxygen. Metal (M) has atomic mass of 24. The empirical formula of the oxide is– **MO**
- The percentage of oxygen in NaOH is– **40**
- A hydrocarbon is composed of 75% carbon. The empirical formula of the compound is– **CH_4**
- An alkaloid contains 17.28% of nitrogen and its molecular mass is 162. The number of nitrogen atoms present in one molecule of alkaloid is– **Two**
- Empirical formula of a compound is CH_2O and its molecular mass is 90. The molecular formula of the compound is– **$C_3H_6O_3$**
- A compound is composed of O and Mn in equal weight ratio. The empirical formula of the compound is.– **Mn_2O_7**
- The empirical formula and molecular mass of a compound are CH_2O and 180 g respectively. The molecular formula of the compound is– **$C_6H_{12}O_6$**
- A metal nitride M_3N_2 contains 28% of nitrogen. The atomic mass of metal M is– **24**
- The empirical formula and molecular mass of a compound are CH_2O and 180 g respectively. The molecular formula of the compound will be– **$C_6H_{12}O_6$**

Stoichiometric Calculations

- The moles of O_2 required for reacting with 6.8 g ammonia. (.... NH_3 + ... O_2 $\rightarrow$.... NO + ... H_2O) is– **0.5**
- The molarity of pure water is– **55.6 M**

- If 1 ml of water contains 20 drops, then the number of molecules in a drop of water is– **1.673×10^{21}**
- The molar ratio of Cr^{2+} to Cr^{3+} in a mixture of $CrSO_4$ and $Cr_2(SO_4)_3$ having equal number of sulphate ions in both sulphates is– **3 : 2**
- In an organic compound of molar mass 108 g mol^{-1} C, H and N atoms are present in 9 : 1 : 3.5 by weight. Molecular formula can be– **$C_6H_8N_2$**
- In the reaction, $2Al(s) + 6HCl(aq) \rightarrow 2Al^{3+}(aq) + 3H_2(g)$,– **11.2 L $H_2(g)$ at STP is produced for every mole HCl(aq)**
- The molarity of a solution, that contains 5.85 g of NaCl (s) per 500 mL– **0.2 mol L^{-1}**
- The molality of the solution containing 18.25 g of HCl gas in 500 g of water is– **1 m**
- The mass percent of carbon in carbon dioxide is – **27.27%**
- If the density of a solution is 3.12 g mL^{-1}, the mass of 1.5 mL solution in significant figures is– **4.7 g**
- One mole of carbon weighs 12g, the number of atoms in it is equal to– **6.022×10^{23}**
- The number of moles of hydrogen molecules required to produce 20 moles of ammonia through Haber's process is– **30**
- Number of significant figures in 6.62×10^{-34}– **Three**
- The number of significant figures in 2.653×10^4 is– **4**
- Chemical fertilizer are– **Urea, Sodium nitrate, Ammonium sulphate**
- Total number of significant figures present in 0.010100×10^3 are – **5**
- Appropriate significant figures as a result of addition of 3.0223 and 5.041– **8.063**
- Total seconds as there in 3 days– **259200 s**

Law of conservation of mass

- Illustrates the law of multiple proportions, the pairs is– **PbO, PbO_2**
- The main drawback of Dalton's atomic theory is– **It could not explain the law of gaseous volumes, It could not explain how and why atoms combine to form molecules**
- The mass of one mole of a substance in grams is called its– **Molar mass**
- The mass percent of oxygen in ethanol is– **34.78%**
- The mode of concentration that does not change with temperature– **Molality**
- A measured temperature on Fahrenheit scale is 200^0F. This reading on Celsius scale will be– **93.3^0C**

EXAM POINT

Uncertainty in measurement

The units of surface tension and viscosity of a liquid respectively are– **$N\ m^{-1}$, $kg\ m^{-1}\ s^{-1}$**	**TS-EAMCET-09.08.2021, Shift-I WB-JEE-2015**
The prefix 10^{18} is– **Exa**	**BITSAT 2015, 2006**
For a A + B products the rate of the reaction is given by Rate = K [A] $[B]^2$. The units of rate constant (K) will be– **$mol^{-2}\ L^2 S^{-1}$**	**AP EAPCET 20.08.2021 Shift-II**
Unit of angular momentum of an electron in an orbital of an atom– **J-s**	**Kerala-CEE-2019**
The SI unit of electrochemical equivalent is– **kg C^{-1}**	**MHT CET-03.05.2019, SHIFT-I**
The absolute zero temperature is 0 Kelvin. In ºC unit the absolute zero temperature is – **–273.15ºC**	**NDA (II)-2018**
The SI unit of density is– **kg m^{-3}**	**MHT CET-2018**
The unit of atomic mass, amu is– **u**	**MHT CET-2018**
The dimension of $[ML^0T^{-2}]$ is– **Surface tension**	**WB-JEE-2017**
Dimension of universal gas constant (R) is– **$[VPT^{-1}n^{-1}]$**	**J & K CET-(2012)**
How is 0.0120 written as a scientific notation– **1.2×10^{-2}**	**UPTU/UPSEE-2011**
The charge on an electron in Coulombs is– **1.602×10^{-19}**	**BCECE-2009**
The value of amu is – **1.66×10^{-27} kg**	**UP CPMT-2003**
The radius of an atomic nucleus is generally expressed in units is – **Fermi**	**AP-EAMCET (Medical), 2001**
The particles size of colloidal system is – **10^{-6} m to 10^{-9} m**	**(NEET-1996)**
The dimensions of pressure are the same as that of– **Energy per unit volume**	**NEET-1995**

Laws of chemical combination

The mass of one mole of electron is–	**0.55 mg**	**UP CPMT-2010 UPTU/UPSEE-2006**
The number of moles of oxygen obtained by the electrolytic decomposition of 108 g water is	**3**	**JIPMER-2008, JCECE-2007**
The number of moles of $KMnO_4$ reduced by one mole of KI in alkaline medium is–	**Two**	**JCECE-2012 JIPMER-2007**
A gas is found to have a formula $[CO]_x$. Its vapour density is 70, the x is–	**5.0**	**BCECE-2007 BITSAT-2006**
Number of atoms of He is 100 amu of He (atomic wt. of He is 4) are–	**25**	**BITSAT-2012 BCECE-2008**
The number of electron present in 2.3g of NO_2 is–	$\mathbf{6.92 \times 10^{23}}$	**Assam CEE-2021**
Number of atom in 5.586 g Fe ($M = 55.86\ g\ mol^{-1}$) is–	**Twice of 0.6 g of C**	**Assam CEE-2021**
Number of moles of dichromate needed to oxidizes one mole of Sn^{2+} is–	**1/3**	**TS-EAMCET 09.08.2021, Shift-I**
$KMnO_4$ oxidises oxalic acid in acidic medium. The number of CO_2 molecules produced per mole of $KMnO_4$ is	**5**	**TS EAMCET 05.08.2021, Shift-I**
The moles of electrons weighs in one kg is –	$\mathbf{1.8 \times 10^{6}}$	**TS EAMCET 10.08.2021, Shift-II**
When oxalic acid is oxidised with acidified $KMnO_4$, the number of moles of CO_2 liberated is (consider balancing the reaction)–	**10**	**TS EAMCET 10.08.2021, Shift-I**
The number of sodium ions present in 0.5 mole of sodium ferrocyanide is–	$\mathbf{12 \times 10^{23}}$	**TS-EAMCET (Engg.), 05.08.2021 Shift-II**
The volume strength (in L) of 3N H_2O_2 is approximately–	**17**	**AP EAPCET 24.08.2021 Shift-II**
The mole elevation constant is the ratio of Elevation in boiling point to–	**Molality**	**AP EAPCET 19-08-2021 Shift-I**
One mole of oxygen gas at STP is equal to–	$\mathbf{6.022 \times 10^{23}}$ **molecules of oxygen**	**AP EAMCET (Engg.) 17.09.2020 Shift-I**
Units is useful in relating concentration of solution with its vapour pressure–	**Mole fraction**	**AP EAMCET (Engg.) 21.09.2020, Shift-I**
The gram of sodium (atomic mass 23 u) is required to prepare one mole of ethane from methyl chloride by Wurtz reaction–	**46**	**MHT CET-02.05.2019, Shift-II**
The volume of 1 mole of any pure gas at standard temperature and pressure is always equal to–	$\mathbf{0.022414\ m^3}$	**MHT CET-02.05.2019, Shift-II**
In the reaction of oxalate with permanganate in acidic medium, the number of electrons involved in producing one molecule of CO_2 is–	**1**	**[JEE Main 2019, 10 Jan Shift-II]**
Total number of atoms in 44 g of CO_2 is–	$\mathbf{1.806 \times 10^{24}}$	**J & K CET-(2019)**
The amount of water (g) produced by the combustion of 32 g of methane is–	**72 g**	**Assam CEE-2019**
100 mL brandy contains 40 mL ethanol. The mole fraction of water is–	**0.6**	**CG PET -2018**
Mass % of carbon in ethanol is–	**52**	**Kerala-CEE-2018**
The Avogadro number or a mole represents–	$\mathbf{6.02 \times 10^{23}}$ **atoms**	**HP CET-2018**
How many moles of electrons will weigh one kilogram–	$\mathbf{\frac{1}{9.108 \times 6.023} \times 10^{8}}$	**WB-JEE-2018**
The number of molecules of 8 g of oxygen gas at NTP is–	$\mathbf{\frac{1}{4} \times 6.022 \times 10^{23}}$	**Assam CEE-2018**
Number of electrons present in 3.6 mg of NH_4^+ are–	$\mathbf{1.20 \times 10^{20}}$	**AMU-2017**
The yield of acetanilide in the reaction (100% conversion) of 2 moles of aniline with 1 mole of acetic anhydride is–	**270 g**	**WB-JEE-2017**

How much CO_2 is produced on heating of 1 kg of carbon– **11/3 kg**	**NDA (II)-2017**
The compound $C_6H_{12}O_4$ contains– **Six times the mass percent of C as compared to the mass percent of H**	**NDA (II)-2017**
The number of moles of H_2O in one litre is– **55.55**	**SRMJEEE – 2015, 2010**
If 27 g of water is formed during complete combustion of pure propene (C_3H_6), the mass of propene burnt is– **21 g**	**Kerala-CEE-2016**
Number of atoms of sulphur in 9.8 grams of H_2SO_4 are– **0.6023×10^{23}**	**BCECE-2016**
For 1 molar solution of NaCl in water at 25^0C and 1-atm pressure show that– **Molarity = normality**	**BCECE-2016**
20 volume of H_2O_2 means– **1 mL of solution liberate 20 mL of O_2 at STP**	**JCECE - 2016**
The number of oxygen atoms in 4.4g of CO_2 is– **1.2×10^{23}**	**Karnataka-CET-2016**
The ions per molecular are produced in the solution, when Mohr salt is dissolved in excess of water– **5**	**Karnataka-CET-2015**
A mixture of gases contains H_2 and O_2 gases in the ratio of 1 : 4 (w/w). The molar ratio of the two gases in the mixture– **4 : 1**	**NEET-2015, cancelled**
The total number of protons in 10g of calcium carbonate is– **3.0115×10^{24}**	**Assam CEE-2014**
The volume strength of 1 molar solution of H_2O_2 is– **11.2**	**JCECE - 2014**
The system that contains the maximum number of atoms is– **2 g of H_2**	**WB-JEE-2014**
The volume occupied by 16 g of oxygen gas at S.T.P. is– **11.2 L**	**AMU-2013**
The mass of 112 cm^3 of NH_3 gas at STP is– **0.085 g**	**Karnataka-CET-2013**
The number of water molecules present in a drop of water weighing 0.018 g is– **6.022×10^{20}**	**Karnataka-CET-2013**
H_2O_2 oxidises MnO_2 is MnO_4^- in basic medium, H_2O and MnO_2 react in the molar ratio of– **3 : 2**	**BCECE-2013**
Number of atoms in 560 cm^3 of oxygen at S.T.P. is– $\mathbf{\frac{1}{20} \times 6.022 \times 10^{23}}$	**COMEDK-2012**
The vapour density of a mixture containing NO_2 and N_2O_4 is 27.6 Mole fraction of NO_2 in the mixture is– **0.8**	**AIIMS-2012**
Avogadro number (6.023×10^{23}) of carbon atoms are present in– **44 grams of $^{12}CO_2$**	**J & K CET-(2012)**
The total number of electrons present in 18 mL of water (density = 1g mL^{-1}) is– **6.02×10^{24}**	**Karnataka-CET-2012**
The mole fraction of methanol is in 4.5 molal aqueous solution is– **0.05**	**Kerala-CEE-2012**
The number of sodium atoms in 2 moles of sodium ferrocyanide is– **48×10^{23}**	**UPTU/UPSEE-2012**
If one mole of a substance is present in 1kg of solvent then its concentration is called– **Molal conc**	**BCECE-2011**
0.1 mol HCl is equal to– **3.65 g**	**JIPMER-2011**
The number of molecules of CO_2 liberated by the complete combustion of 0.1 g atom of graphite in air is– **6.02×10^{22}**	**AP-EAMCET- (Engg.) - 2010**
The number of water molecules is maximum in– **18 moles of water**	**NEET-2013**
The total number of atoms of all elements present in 1 mole of ammonium dichromate is– **114.437×10^{23}**	**AMU – 2010**
In redox reaction 1 g-eq of reducing agent requires P gm-eq. of oxidizing agent. The value of P is– **1**	**BITSAT 2010**
Molality of a solution is equal to– $\mathbf{\frac{\text{number of Moles of solute}}{\text{number of kilogram of solvent}}}$	**CG PET- 2010**
The molecules present in 5.6 L of sulphur dioxide at STP is– **1.5×10^{23}**	**J & K CET-(2010)**
The number of atoms in 0.1 mol of triatomic gas is ($N_A = 6.02 \times 10^{23}$ mol^{-1}) **1.806×10^{23}**	**NEET-2010**
The moles of helium gas occupy 22.4 L at 0^o C and at 1 atm pressure– **1.0**	**BCECE-2010**
1 mole of CO_2 contains– **6×10^{23} atoms of C**	**BCECE-2009**
If $NO_2(N_2O_4)$ is dissolved in NaOH, we get solution of– **Mixture of $NaNO_2$ and $NaNO_3$**	**CG PET-2009**

If 'F' is Faraday and 'N' is Avogadro number, then charge of electron can be expressed as– **F/N**	**CG PET -2009**
The number of molecules in 18 mg of water in terms of Avogadro number N is– **10^{-3} N**	**J & K CET-(2009)**
The volume of oxygen at STP in litres is required to burn 4 gm of methane gas completely– **11.2**	**J & K CET-(2009)**
The number of electrons required to reduce 4.5×10^{-5} g of Al is– **3.01×10^{18}**	**MHT CET-2009**
Contains greatest number of oxygen atoms– **1 g of O, 1 g of O_2, 1 g of O_3**	**UPTU/UPSEE-2009**
One mole of magnesium nitride on the reaction with an excess of water gives– **Two moles of NH_3**	**UPTU/UPSEE-2008**
2 N HCI solution will have same molar concentration as a– **4.0 N H_2SO_4**	**WB-JEE-2008**
1 mole of methyl amine on reaction with nitrous acid gives at NTP– **22.4 Litre of nitrogen**	**WB-JEE-2008**
80 g of oxygen contains as many atoms as in– **5 g of hydrogen**	**Karnataka-CET, 2008**
The number of moles of lead nitrate needed to coagulate 2 moles of colloidal $[AgI]I^-$ is– **1**	**Kerala-CEE-2008**
The number of electrons in a mole of hydrogen molecule is– **12.046×10^{23}**	**BITSAT 2008**
Maximum number of molecules of CH_3I that can react with a molecule of CH_3NH_2 are– **3**	**Karnataka-CET-2007**
Molarity of a given orthophosphoric acid solution is 3M. It's normality is– **9N**	**Karnataka-CET-2007**
One mole of oxygen at 273 K and one mole of sulphur dioxide at 546 K are taken in two separate containers, then– **Kinetic energy of O_2 < kinetic energy of SO_2**	**Karnataka-CET-2007**
The amount of bromine will be required to convert 2 g of phenol into 2, 4, 6-tribromo phenol– **10.22 g**	**UPTU/UPSEE-2007**
138 g of ethyl alcohol is mixed with 72 g of water. The ratio of mole fraction of alcohol to water is– **3 : 4**	**AP EAMCET (Engg.) -2007**
CO_2 gas obtained by the combustion of 12 mL butane gas is– **48 mL**	**CG PET -2006**
1.25 g NH_3 contains how many atoms– **1.77×10^{23}**	**JCECE - 2006**
Number of atoms of He in 100 amu of He (atomic wt. of He is 4) are– **25**	**UP CPMT-2006**
One mole of CO_2 contains- **6.02×10^{23} atoms of C**	**UPTU/UPSEE-2006**
In the equation $H_2S + 2HNO_3 \longrightarrow 2H_2O + 2NO_2 + S$. The equivalent weight of hydrogen sulphide is– **17**	**BCECE-2006**
Number of moles of $K_2Cr_2O_7$ reduced by one mole of Sn^{2+}– **1/3**	**UP CPMT-2005**
The moles of $Al_2(SO_4)_3$ would be in 50 g of the substance– **0.140 mol**	**UPTU/UPSEE-2005**
The number of moles of proton which can be easily given by butyne-1 (1mole) is– **1**	**CG PET -2005**
1 moles of crystalline NaCl will have how many unit cells– **1.506×10^{23}**	**CG PET -2005**
In 1 mole of NaCl the protons are– **28 moles**	**CG PET -2005**
The number of sodium atoms in 2 moles of sodium ferrocyanide is– **48×10^{23}**	**BITSAT 2005**
Mole fraction of a solute in benzene is 0.2 then find molality of solute– **3.2**	**BCECE-2004**
Vapour pressure of dilute aqueous solution of glucose is 750 mm of mercury at 373 K. The mole fraction of solute is– **1/76**	**J & K CET-(2004)**
One of the mole of a gas at NTP occupies 22.4 litres. This fact was derived from– **Avogadro's hypothesis**	**J & K CET-(2004)**
Number of atoms of oxygen present in 10.6 g of Na_2CO_3 will be– **1.806×10^{23}**	**J & K CET-(2004)**
The numerical value of $\frac{N}{n}$ (where, N is the number of molecules in a given sample of gas and n is the number of moles of the gas) is– **6.02×10^{23}**	**Kerala-CEE-2004**
The mass of 11.2 L of ammonia gas at STP is– **8.5 g**	**Kerala-CEE-2004**
720 g water contain the number of moles– **40**	**JCECE - 2003**

The total number of protons in 10g of calcium carbonate is (N_0=6.023×10^{23})– **3.01×10^{24}**	**UP CPMT-2003**
The number of moles of $KMnO_4$ that will be needed to react with one mole of sulphite ion in acidic solution is–	**2/5**	**AMU-2002**
The volume strength of 1.5 N H_2O_2 solution is–	**8.4**	**AMU-2002**
One mole of SO_2 corresponds to–	**6.02×10^{23} molecules of SO_2**	
The number of atoms in 0.004 g of magnesium is close to–	**10^{20}**	**AMU-2002**
Number of atoms in 560 g of Fe (atomic mass = 56 g mol^{-1}) is–	**Twice that of 70 g N_2, half that of 20 g H**	**[AIEEE 2002]**
Weight of 4 L of N_2 gas as N.T.P. is–	**5 g**	**J & K CET-(2002)**
One mole of CH_4 contains–	**4 g atoms of hydrogen**	**UP CPMT-2002**
120 g of urea is present in 5 L of solution. The active mass of urea is–	**0.4**	**UP CPMT-2001**
7.5 g of a gas occupies 5.6 L of volume at S.T.P. The gas is–	**NO**	**AP-EAMCET (Medical), 2001**
Temperature does not affect–	**Molality**	**AIIMS-1997-2001**
Number of molecules in one litre of water is close to–	**55.5 × 6.023 × 10^{23}**	**J & K CET-(2000)**
The number of moles of hydrogen atoms in 3.2 g of methane is–	**0.8**	**J & K CET-(1999)**
The number of atoms in 4.25 g of NH_3 is approximately–	**6 × 10^{23}**	**NEET-1999**
The molar concentration of 20g of NaOH present in 5 litre of solution is–	**0.1 mols/litre**	**AIIMS-1998**
Volume of a gas at NTP is 1.12×10^{-7} cc. The number of molecule in it is–	**3.01 × 10^{12}**	**AIIMS-1998**
Ionic compounds contains greater number of ions–	**100 g Na_2O (formula mass 62)**	**J & K CET-(1998)**
At STP, the density of a gas (molecular weight 45) is–	**2 g/litres**	**J & K CET-(1997)**
Avogadro's number of oxygen atom weight–	**16 g**	**AIIMS-1996**
The number of moles of water present in 180 gm of water is–	**10**	**AIIMS-1996**
The mole fraction of solute in 20% aqueous H_2O_2 solution is–	**0.1168**	**AP EAMCET- 1992**
The number of oxygen atoms in 4.4 g of CO_2 is–	**1.2 × 10^{23}**	**NEET-1989**
At STP the density of CCl_4 vapour of g/L will be nearest to–	**6.87**	**NEET-1988**
Components form homogeneous mixture–	**Ethyl alcohol + water**	**MHT CET-02.05.2019, SHIFT-III**
Volume of water needed to mix with 10 mL 10N HNO_3 to get 0.1N HNO_3 is	**–990mL**	**AIIMS-2017**
The proposition 'equal volumes of different gases contain equal numbers of molecules at the same temperature and pressure' is known as–	**Avogadro's hypothesis**	**NDA (II)-2017**
On combustion of x-g of ethanol in bomb calorimeter, y-joules of heat energy is produced. The heat of combustion of ethanol (ΔH_{comb}) is–	$\mathbf{\Delta H_{comb} = -\frac{y}{x} \times 44\, J mol^{-1}}$	**BCECE-2017**
Combination of one volume of nitrogen with three volumes of hydrogen produces–	**Two volumes of ammonia**	**NDA (II)-2016**
The formation of CO and CO_2 illustrates the law of–	**Multiple proportion**	**BITSAT 2014**
If Avogadro number N_A, is changed from 6.022 × 10^{23} mol^{-1} to 6.022 × 10^{20} mol^{-1}, this would change–	**The mass of one mole of carbon**	**NEET-2012**
The product of atomic weight and specific heat of any element is a constant, approximately 6.4. This is known as–	**Dulong Pettit law**	**BITSAT-2011**
Gram molecular volume of oxygen at STP is–	**22400 cm^3**	**Karnataka-CET-2007**
The total number of valence electrons in 4.2 g of N_3^- ion is (N_A is the Avogadro's number)–	**1.6 N_A**	**NEET-1994**

Atomic and molecular masses and mole concept and molar mass, empirical and molecular formula

The highest number of helium atoms is in-	**4 mol of helium**	**NEET-05.05.2024**
In acidic medium, the equivalent weight of $K_2Cr_2O_7$ (Mol. wt. = M) is–	**M/6**	**WBJEE-2012** **UPTU/UPSEE-2009**
Vapour density of a metal chloride is 83. If equivalent weight of the metal is 6, its atomic weight will be–	**24**	**AP EAMCET (Engg.) 21.09.2020, Shift-I**
The mass of one atom of ^{12}C is –	**1.9923×10^{-23}g**	**WB-JEE-2020**
In a flask, the weight ratio of CH_4(g) and SO_2(g) at 298 K and 1 bar is 1:2. The ratio of the number of molecules of SO_2(g) and CH_4(g) is–	**1:2**	**COMEDK-2020**
Equivalent mass of $K_2Cr_2O_7$ in acidic solution is equal to–	**Molecular mass/ 6.**	**COMEDK-2019**
Equivalent weight of $KMnO_4$ is equal to–	**One-fifth its molecular weight**	**COMEDK-2019**
In acid medium MnO_4^- is reduced to Mn^{2+}, by a reducing agent. Then the equivalent mass of $KMnO_4$ is given by– (M = molecular mass)	**M/5**	**Manipal-2019**
The equivalent weight of oxalic acid in $C_2H_2O_4.2H_2O$ is–	**63**	**NDA (I)-2019**
In the standardization of $Na_2S_2O_3$ using $K_2Cr_2O_7$ by iodometry, the equivalent weight of $K_2Cr_2O_7$ is–	**Molecular weight/6**	**Manipal-2018**
The masses of oxygen combine with a fixed mass of hydrogen to form H_2O and H_2O_2, respectively, bear the simple ratio 1:2–	**Law of multiple proportions**	**COMEDK-2018**
The number of times the comparative mass of a neutron is heavier than an electron is–	**~1842**	**J & K CET-(2018)**
The compound Na_2CO_3. xH_2O has 50% H_2O by mass. The value of "x" is–	**6**	**Kerala-CEE-2017**
A bivalent metal has an equivalent mass of 32. The molecular mass of the metal nitrate is–	**188**	**COMEDK-2016**
Sulphur forms the chlorides S_2Cl_2 and SCl_2. The equivalent mass of sulphur in SCl_2 is–	**16 g/mol**	**AIIMS-2015**
3.011×10^{22} atoms of an element weighs 1.15 g. The atomic mass of the element is–	**23**	**AP-EAMCET (Engg.)-2015**
The equivalent weight of $Na_2S_2O_3$ in the reaction is $2Na_2S_2O_3 + I_2 \rightarrow Na_2S_4O_6 + 2NaI$–	**M**	**JCECE - 2014**
The ratio of masses of oxygen and nitrogen in a particular gaseous mixture is 1 : 4 The ratio of number of their molecule is–	**7:32**	**[JEE Main-2014]**
The mass of one molecule of yellow phosphorus is (Atomic mass, P = 30)–	**1.993×10^{-19} mg**	**MHT CET-2014**
Equivalent weight of $(NH_4)_2Cr_2O_7$ in the change is $(NH_4)_2Cr_2O_7 \rightarrow N_2 + Cr_2O_3 + 4H_2O$ –	**Mol. wt./6**	**UP CPMT-2013**
The equivalent mass of a certain bivalent metal is 20. The molecular mass of its anhydrous chloride is–	**111**	**Karnataka-CET-2012**
A certain gas takes three times as long to effuse out as helium. Its molecular mass will be–	**36 u**	**NEET-2012**
Equivalent and molecular masses are same in–	**Mohr's salt**	**COMEDK-2011**
The equivalent weight of $MnSO_4$ is half of its molecular weight when it is converted to–	**MnO_2**	**CG PET- 2011**
If the equivalent weight of a trivalent metal is 32.7, the molecular weight of its chloride is–	**204.6**	**JCECE - 2011**
2g of metal carbonate is neutralized completely by 100 mL of 0.1 N HCl. The equivalent weight of metal carbonate is–	**200**	**WB-JEE-2011**

In the reaction of sodium thiosulphate with I_2 in aqueous medium the equivalent weight of sodium thiosulphate is equal to– **Molar mass of sodium thiosulphate**	**WB-JEE-2010**
The number of water molecules differing in molecular mass formed by hydrogen isotopes and oxygen isotopes– **6**	**SCRA-2010**
The vapour density of ozone is– **24**	**BITSAT-2010**
The equivalent weight of Potassium permanganate ($KMnO_4$) in neutral medium will be– $\frac{\textbf{Atomic weight}}{\textbf{3}}$	**MPPET- 2009**
The standard for atomic mass is– $_6C^{12}$	**BCECE-2009**
The equivalent mass of potassium permanganate in alkaline medium is its– **Molar mass itself**	**J & K CET-(2009)**
The formula mass of Mohr's salt is 392. The iron present in it is oxidised by $KMnO_4$ in acid medium. The equivalent mass of Mohr's salt is– **392**	**JCECE - 2009**
A bivalent metal has an equivalent mass of 32. The molecular mass of the metal nitrate is– **188**	**Karnataka-CET, 2009**
Mass of 0.1 mole of methane is– **1.6 g**	**Karnataka-CET, 2008**
Electron density in the yz plane of $3d_{x^2-y^2}$ orbital is– **Zero**	**J & K CET-(2008)**
The milliequivalent in 60 ml 4M H_2SO_4 is– **480**	**[BITSAT – 2007]**
1.520 g of hydroxide a metal on ignition gave 0.995 g of oxide. The equivalent weight of metal is– **9**	**UP CPMT-2006**
The mass of a photon with wave length 3.6 Å is– $\mathbf{6.135\times10^{-29}}$ **kg**	**AMU-2005**
The standard adopted for the determination of atomic weight of elements is based on– $\mathbf{C^{12}}$	**JCECE - 2005**
The mass of carbon anode consumed (giving only carbon dioxide) in the production of 270 kg of aluminium metal from bauxite by the Hall process is– **90 kg**	**NEET-2005**
The ratio of mass of an electron to the mass of a proton is– **1 : 1837**	**UPTU/UPSEE-2004**
Equivalent weight of an acid– **Depends on the reaction involved**	**UPTU/UPSEE-2004**
The number of gram equivalent of H_2SO_4 in 1000 mL 3M solution is– **6**	**JCECE - 2003**
The equivalent weight of $KMnO_4$ in acidic medium is– **31.6**	**UP CPMT-2002**
The oxygen obtained from 72 kg water is– **64 kg**	**UP CPMT-2002**
The weight of a single atom of oxygen is– $\mathbf{2.656\times10^{-23}}$ **g**	**AIIMS-1998**
The molecular mass of a volatile substance may be measured by– **Victor Meyer's method**	**AIIMS-1994**
The molecular formulae for phosgene and tear gas are …. and …. respectively– $\mathbf{COCl_2}$ **and** $\mathbf{CCl_3NO_2}$	**GUJCET-2015, 2016**
An organic compound contains 60% C; 4.48% H and 35.5% O. Its empirical formula is– $\mathbf{C_9H_8O_4}$	**TS-EAMCET (Engg.), 05.08.2021 Shift-II**
In each molecule of carbon tetrachloride. the mass percent of carbon and chlorine respectively are _____ and _____.– **7.84 & 92.80**	**AP EAPCET 24.08.2021, Shift-I**
A pure compound contains 2.4g of C, 1.2×10^{23} atoms. Its empirical formula is– **CHO**	**Karnataka-CET-2021**
The mass percentage of nitrogen in histamine is– **37.84**	**[JEE Main 2020, 9 Jan Shift-I]**
The formula of dichlorobis (urea) copper (II) is– $\mathbf{[CuCl_2\{O=C(NH_2)_2\}_2]}$	**COMEDK-2019**
An organic compound is found to contain C= 54.5% , O=36.4% and H=9.1% by mass. Its empirical formula is– $\mathbf{C_2H_4O}$	**COMEDK-2019**
The empirical formula of the compound if M = 68% (atomic mass = 34) and remaining 32% oxygen is– **MO**	**AIIMS 25 May 2019 (Morning)**

Law of Multiple proportion– **H_2O, H_2O_2**	**J & K CET-(2019)**
The percentage of carbon in urea is– **20%** (Atomic mass C = 12, H = 1, N = 14, O = 16)	**MHT CET-02.05.2019, SHIFT-III**
A compound contains 26% nitrogen and 74% oxygen. Its molecular formula will be– **N_2O_5**	**Tripura JEE-2019**
The formulas of the compounds respectively are Bleaching powder; Quicklime; Plaster of Paris; Slaked lime– **$Ca(OCl)_2$, CaO, $CaSO_4 \frac{1}{2} H_2O$, $Ca(OH)_2$**	**Assam CEE-2018**
A metal M (specific heat 0.16) forms a metal chloride with 65% chlorine present in it. The formula of the metal chloride will be– **MCl_2**	**WB-JEE-2018**
Two oxides of an non-metal X contain 50% and 40% of non-metal respectively. If the formula of the first oxide is XO_2, Then the formula of second oxide is– **XO_3**	**AP EAMCET-2017**
An alkane has a C/H ratio (by mass) of 5.1428. Its molecular formula is– **C_6H_{14}**	**COMEDK-2017**
Blister copper contains ____ percentage of copper– **98**	**SRMJEEE-2016**
A compound contain three elements X, Y and Z. The oxidation number. Of X, Y and Z are +3, +5 and –2 respectively. The possible formula of the compound is– **$X_3(YZ_4)_3$**	**BCECE-2016**
The percentage of oxygen in CH_2O is– **53.33%**	**JCECE - 2016**
An organic compound contains C = 40%, H = 13.33% and N = 46.67%. Its empirical formula is– **CH_4N**	**Karnataka-CET-2016**
The empirical formula of a compound is CH_2.One mole of this compound has a mass 42g. Its molecular formula is– **C_3H_6**	**CG PET- 2015**
An organic compound contains 90% carbon and 10% hydrogen by mass. Its empirical formula is– **C_3H_4**	**Kerala-CEE-2015**
The formula for sodium trioxalatoaluminate (III) is– **$Na_3[Al(C_2O_4)_3]$**	**COMEDK-2015**
The molecular formula of Dithionic acid is– **$H_2S_2O_6$**	**SRMJEEE – 2014**
Two oxides of a metal contain 50% and 40% metal (M) respectively. If the formula of first oxide is MO_2, the formula of second oxide will be– **MO_3**	**Assam CEE-2014**
The percentage of water of crystallisation of a sample of blue vitriol is– **36.07%**	**JCECE - 2014**
A compound contains 38.8% C, 16% H, 42.5% N. The formula of compound will be– **CH_3NH_2**	**MPPET-2013**
The arsenic content of an agricultural insecticide was reported as 28% As_2O_5. the percentage of arsenic in this preparation is– **18%**	**AMU-2013**
Analysis shows that a binary compound of X (atomic mass = 10) and Y (atomic mass = 20) contains 50% X. The formula of the compound is– **XY_2**	**AMU-2013**
Empirical formula of a compound is CH_2O and its molecular mass is 90, the molecular formula of the compound is– **$C_3H_6O_3$**	**Karnataka-CET-2013**
An organic compound contains 38.8% carbon, 16% hydrogen & 45.2% nitrogen. Its empirical formula is– **CH_3NH_2**	**MPPET - 2012**
In a hydrocarbon, mass ratio of hydrogen and carbon is 1:3, the empirical formula of hydrocarbon is– **CH_4**	**AIIMS-2012**
The formula of chloral is– **CCl_3CHO**	**JCECE - 2012**
The percentage composition by weight of an aqueous solution of solute (molar mass 150) which boils at 373.26K(k_b=0.52) is– **7**	**CG PET- 2011**
An organic contains 49.3% carbon, 6.84% hydrogen and its vapour density is 73. Molecular formula of the compound is– **$C_6H_{10}O_4$**	**BCECE-2010**
Molecular formula of Glauber's salt is– **$Na_2SO_4 \cdot 10H_2O$**	**JCECE - 2010**
The percentage (by weight) of sodium hydroxide in a 1.25 molal NaOH solution is– **4.76%**	**MHT CET-2009**

An organic compound made of C,H and N contains 20% nitrogen. Its molecular weight is– **70**	**WB-JEE-2009**
The percentage of an element M is 53 in its oxide of molecular formula M_2O_3. Its atomic mass is about– **27**	**Kerala-CEE-2008**
An organic compound contains carbon, hydrogen and oxygen. Its element analysis gave C, 38.71% and H, 9.67%. The empirical formula of the compound would be– **CH_3O**	**NEET-2008**
Composition of azurite mineral is– **$2CuCO_3 \cdot Cu(OH)_2$**	**WB-JEE-2008**
An unknown element forms an oxide. The equivalent wt. of the element if the oxygen content is 20% by wt– **32**	**WB-JEE-2008**
A compound has the empirical formula CH_2O. Its vapour density is 30. Its molecular formula is– **$C_2H_4O_2$**	**CG PET -2007**
In a compound C, H and N are present in 9 : 1 : 3.5 by weight. If molecular weight of the compound is 108, then the molecular formula of the compound is– **$C_6H_8N_2$**	**UP CPMT-2006**
A compound contains 54.55% carbon, 9.09% hydrogen, 36.36% oxygen. The empirical formula of this compound is– **C_2H_4O**	**UPTU/UPSEE-2004**
A petroleum fraction having boiling range 70-200°C and containing 6-10 carbon atoms per molecule is called– **Gasoline**	**UPTU/UPSEE-2004**
The molecular formula of borazole is– **$B_3N_3H_6$**	**AP EAMCET- 2001**
The molecular formula of gypsum is – **$CaSO_4.2H_2O$**	**AP EAMCET- 2000**
The molecular formula of white phosphorus is– **P_4**	**AP EAMCET- 2000**
The empirical formula of a compound is CH_2O. Its molecular weight is 180. The molecular formula of compounds is– **$C_6H_{12}O_6$**	**AIIMS-1999**
The percentage of oxygen in NaOH is– **40%**	**AIIMS-1996**
The mole percentage of oxygen in a mixture of 7.0 g of nitrogen and 8.0 g of oxygen is– **50**	**A-P EAMCET-1995**
An organic compound having carbon, hydrogen and sulphur contains 4% of sulphur. The minimum molecular weight of the compound is– **800**	**VITEEE 2015**
Caffeine has a molecular weight of 194 u. If it contains 28.9% by mass of nitrogen, number of atom of nitrogen in one molecule of caffeine is– **4**	**VITEEE 2015**
The elemental analysis of an organic compound gave C: 38.71%, H: 9.67% .The empirical formula of the compound is – **CH_3O**	**Kerala CEE -03.07.2022**

Stoichiometry Calculation

An organic compound has an empirical formula CH_2O. Its vapour density is 45. The molecular formula of compound is– **$C_3H_6O_3$**	**A.P.EAMCET-1995, 1991**
The fractions of Fe^{2+} and Fe^{3+} in $Fe_{0.93}O$ respectively are – **0.85, 0.15**	**GUJCET-2020**
An organic compound contains 24% carbon, 4% hydrogen and remaining chlorine. Its empirical formula is– **CH_2Cl**	**Kerala-CEE-2020**
Pink colour of non-stoichiometric LiCl is due to– **Electrons in the lattice**	**CG PET -2018**
The mass of oxygen gas which occupies 5.6 litres at STP would be– **Half of the gram atomic mass of oxygen**	**COMEDK-2015**
A metal oxide has the empirical formula, $M_{0.96}O_{1.00}$. What will be the percentage of M^{2+} ions in the crystal– **91.67**	**AMU-2015**
The number of moles of electrons required to deposit 36g of Al from an aqueous solution of $Al(NO_3)_3$ is (At. wt. of Al = 27)– **4**	**AP EAMCET (Engg.) - 2012**
The ratio of moles of hydrogen produced when two moles of aluminium react with excess HCl and NaOH separately is– **1 : 1**	**AP - EAMCET(Medical)- 2009**
Value of x in potash alum, $K_2SO_4.Al_x (SO_4)_3 \cdot 24H_2O$ is– **2**	**UP CPMT-2007**
The number of molecules of CO_2 spresent in 44g of CO_2 is– **6.0×10^{23}**	**BCECE-2005**
The number of molecules present in 3.5 g of CO at 0ºC and 760 mm pressure is– **$0.125 \times 6.02 \times 10^{23}$**	**AP-EAMCET-1992**

2. Structure of Atom

Sub-Atomic Particles and Atomic Models

- The charge of an electron was discovered by– **Millikan**
- The element used by Rutherford in his famous scattering experiment was– **Gold**
- Be^{2+} is isoelectronic with ions– **Li**
- ($_{32}Ge^{76}$, $_{34}Se^{76}$) and ($_{14}Si^{30}$, $_{16}S^{32}$) are the examples of– **Isobars and isotones**
- The ratio of charge and mass would be greater for– **Electron**
- The nitride ion in lithium nitride is composed of– **7-protons + 10 electrons**
- The ratio of neutrons in C and Si with respective atomic masses 12 and 28 is– **3 : 7**
- If a species has 16 protons, 18 electrons and 16 neutrons, the species and its charge is– $\mathbf{S^2}$
- The compound having number of protons is greater than the number of neutrons but number of protons is less than the number of electrons– **OH**

Developments Leading to The Bohr's Model of Atom

- The scientist that proposed the atomic model based on the quantisation of energy for the first time is– **Neil Bohr**
- The value of Rydberg constant is– **109, 677 cm^{-1}**
- The lowest energy of the spectral line emitted by the hydrogen atom in the Lyman series is– $\mathbf{\frac{3hR_Hc}{4}}$
- A metal surface is exposed to solar radiations– **The emitted electrons have energy less than a maximum value of energy depending upon the frequency of the incident radiation.**
- Bohr's model can explain–**Spectrum of any atom or ion containing one electron only**
- The species, Bohr's theory is not applicable to–$\mathbf{He^{2+}}$
- The quantum of light energy is called– **Photon**

Hydrogen Atom

- The velocity of electron present in first Bohr orbit of hydrogen atom– **2.18 × 10^6 m/s**
- Time taken for an electron to complete one revolution in Bohr orbit of hydrogen atom is– $\mathbf{\frac{4\pi^2mr^2}{nh}}$
- The wavelength and name of series respectively for the emission transition for H-atom if it starts from the orbit having radius 1.3225 nm and ends at 211.6 pm would be– **434 nm, Balmer**
- The emission spectrum of hydrogen atom discovered first and the region of the electromagnetic spectrum is belongs, to– **Balmer, Visible**
- The velocity of electron in second shell of hydrogen atom is– **1.094 × 10^{6}m/sec**
- If the first ionization energy of H^- atom is 13.6 eV, then the second ionization energy of He^- atom is– **54.4 eV**
- When the electrons of hydrogen atom return to L-shell from shell of higher energy, we get a series of lines in the spectrum. This series is called– **Balmer series**
- The electron of a hydrogen atom jump from n = 4 to n = 1 state, the number of different spectral line emitted are– **6**
- The wave number of the spectral line in the emission spectrum of hydrogen will be equal to 8/9 times the rydberg constant if the electron jumps from– **n = 3 to n = 1**
- The energy ratio of a photon of wavelength 3000Å and 6000Å is– **2:1**
- The first line emission of hydrogen atom spectrum in the Balmer species appears at– **5R/36 cm^{-1}**
- The radius of 2nd Bohr's orbit of hydrogen atom is– **0.2116 nm**
- The maximum energy possessed by an electron is – **At infinite distance from the nucleus**
- The pair where both species have same radius is– $\mathbf{r_2Be^{3+}}$ **and** $\mathbf{r_1H}$
- The ratio of ionization energy of H and Be^{+3} is–**1:16**
- The ratio of the energy of the electron in ground state of hydrogen to the electron in 1st excited state of Be^{3+} is– **1 : 4**
- The transition, one quantum of energy is emitted is– $\mathbf{n_2 = 4 \rightarrow n_1 = 2, n_2 = 3 \rightarrow n_1 = 1, n_2 = 2 \rightarrow n_1 = 1}$

- The wavelength of first line of Balmer spectrum of hydrogen will be– **6569 Å**
- If the radius of 2^{nd} Bohr orbit of hyderogen atom is r_2. The radius of third Bohr orbit will be– $\mathbf{\frac{9}{4}r_2}$
- The ratio of highest possible wavelength of Lyman series is– **4/3**
- Magnitude of kinetic energy in an orbit is equal to– **Half of the P.E.**
- According to Bohr's theory, the angular momentum of an electron in the 4^{th} orbit is– $\mathbf{\frac{2h}{\pi}}$
- If the radius of 1^{st} Bohr orbit be a_0, then radius of 3^{rd} Bohr orbit would be– $\mathbf{9a_0}$

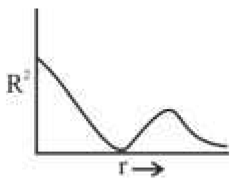
Towards Quantium Mechanical Model of The Atom

- If E_e, E_α and E_p represents the kinetic energy of an electron, α-particle and proton respectively and each moving with same de-broglie wavelength then– $\mathbf{E_e > E_p > E_\alpha}$
- Uncertainty principle was given by– **Heisenberg**
- If uncertainty in position and velocity are equal, then uncertainty in momentum will be– $\mathbf{\frac{1}{2}\sqrt{\frac{mh}{\pi}}}$
- If de-broglie wavelength of mass 'm' is 100 times of its velocity then its value in term of its mass 'm' and planck's constant "h" is– $\mathbf{10\sqrt{\frac{h}{m}}}$
- The wavelength of electron waves in two orbit is in ratio 3:5. The ratio of K.E. of electrons will be–**25:9**
- If uncertainty in position and momentum are equal, then uncertainly in velocity is– $\mathbf{\frac{1}{2m}\sqrt{\frac{h}{\pi}}}$
- The de-broglie wavelength associated with a mass of 1kg having K.E. 0.5J is– $\mathbf{6.626 \times 10^{-34}}$ **m**
- For an electron, if the uncertainty in velocity is Δv, the uncertainty in position Δx is given by– $\mathbf{\frac{h}{4\pi\Delta v}}$
- If uncertainty in the position of an electron is zero, the uncertainty in its momentum will be– **infinite**
- de-Broglie wavelength associated with a material particle is– **Inversely proportional to momentum**
- The uncertainty in the position of an electron and proton is equal, the ratio of the uncertainties in the velocity of an electron and proton is– **1836:1**
- The species have the same number of electron in its outermost as well as penultimate shell is– $\mathbf{Ca^{2+}}$
- The number of waves made by an electron moving in an orbit having maximum magnetic quantum number +3 is– **4**
- The set of quantum no. not applicable for an electron– $\mathbf{3, 1, -2, +\frac{1}{2}}$
- The orbital angular momentum of an electron in f-orbital– $\mathbf{\frac{\sqrt{3}h}{\pi}}$
- Given K L M N The number of electrons
  2 8 11 2
  present in $l = 2$ is– **3**
- The maximum number of electrons that can be held by subshell with azimuthal quantum number "ℓ" in an atom is given by– $\mathbf{2(2\ell + 1)}$
- The maximum number of electrons that can be associated with a quantum number n = 3, l = 1 and m = –1 is– **2**
- The quantum number "m" of a free gaseous atom is associated with– **Spatial orientation of orbital**
- The element is represented by electronic configuration $1s^2 2s^2 2p_x^1 2p_y^1 2p_z^1$ – **N**
- The atomic number of element is 17. The number of orbital containing electron pair in its valence shell is– **3**
- The total number of electrons present in all the p-orbital of bromine are (Given : Atomic no. of Br = 35)– **17**
- The number of unpaired electron in Fe^{3+}(Z = 26) are– **5**
- The orbital angular momentum of p-electron is given as– $\mathbf{\frac{h}{\sqrt{2}\pi}}$
- The total number of orbitals in a shell with principle quantum number n is– $\mathbf{n^2}$
- The represents set of quantum numbers of a 4d electron is – **4, 2, 1, –1/2**
- Any f-orbital can accommodate upto– **2 electrons with opposite spin**
- The atomic numbers of elements X, Y and Z are 19, 21 and 25 respectively. The number of electrons present in the M shells of these elements follow the order– **Z > Y > X**
- This electronic configuration shows element of–

↑↓	↑↓	↑↓ ↑↓ ↑
1s	2s	2p

  Fluorine
- The de-broglie wavelength of an electron moving in a circular orbit is λ.
  The minimum radius of the orbit is given by– $\mathbf{\frac{\lambda}{2\pi}}$
- Last line of Lyman series for H–atom has wavelength λ_1 Å. The 2^{nd} line of Balmer series has wavelength λ_2 Å, then– $\mathbf{\frac{16}{\lambda_2} = \frac{3}{\lambda_1}}$

- The electron having quantum numbers n = 4 & m = 2 is– **the value of ℓ may be 2, The value fo ℓ may be 3, The value of s may be +1/2**
- Change in orbit angular momentum when an electron makes a transition corresponding to 3rd line of Balmer series in Li^{2+} ion is– $\mathbf{\frac{3h}{2\pi}}$
- The ionisation energy of H atom is x J/atom. The wavelength of first Balmer line for He^{+} ion is– $\mathbf{\frac{9hc}{5x}}$
- The total number of orbitals in the principal shell of He^{+} that has energy equal to $\frac{-Rhc}{4}$ (where R is Rydberg's constant) is– **4**
- If ΔE is the energy emitted in eV when an electronic transition occurs from higher energy level to lower energy level in H–atom, the λ of the line produced is approximately equal to– $\mathbf{\frac{12375}{\Delta E}\overset{0}{A}}$
- The energy of a possible excited state of hydrogen is– **–3.4 eV**
- The ratio of area covered in 2nd orbit to first orbit is– **16 : 1**
- An electron in an atom undergoes transition in such a way potential energy will be– $+\frac{3}{2}x$
- The transition in He^{+} ion shall have the same wave number as the first line in Balmer series of hydrogen atom is– **6 → 4**
- The maximum number of electrons that can be accomodated in principal number 4 – **32**
- The number of elements would be in the 11nd period of the Periodic Table if the spin quantum numbers could have the value $+\frac{1}{2}, 0, -\frac{1}{2}$ – **12**
- In an atom, having 2K, 8L, 18M and 2N electrons in the ground state. The total number of electrons having magnetic quantum number, m = 0 is– **14**
- The probability density curve for 2s electron appears like as–



- If an electron in H atom has an energy of –78.4 kcal/mol. The orbit in the electron is present is– **2nd**
- Difference between nth and (n + 1)th Bohr's radius of H– atom is equal to its (n –1)th Bohr's radius. The value of n is– **4**
- Light of wavelength λ shines on a metal surface with intensity x and the metal emits Y electrons per second of average energy, Z. The happen to Y and Z if x is doubled– **Y will be doubled but Z will remain same**
- Splitting of spectral lines under the influence of electric field is called– **Stark effect**
- The conclusions could not be derived from Rutherford's α-particle scattering experiment is– **Electrons move in a circular path of fixed energy called orbits.**
- The properties of atom could be explained correctly by Thomson model of atom is–**Overall neutrality of atom**
- Two atoms are said to be isobars if– **Sum of the number of protons and neutrons is same but the number of protons is different**
- The number of radial nodes for 3p orbital is– **1**
- Number of angular nodes for 4d orbital– **2**
- The responsible to rule out the existence of definite paths or trajectories of electrons is– **Heisenberg's uncertainty principle**
- Total number of orbitals associated with third shell will be– **9**
- Orbital angular momentum depends on– ***l***
- Chlorine exists in two isotopic forms. C*l*-37 and C*l*-35 but its atomic mass is 35.5. This indicates the ratio of C*l*-37 and C*l*-35 is approximately– **1 : 3**
- The pair of ions having same electronic configuration is– $\mathbf{Fe^{3+}, Mn^{2+}}$
- For the electrons of oxygen atom, is– **The two electrons present in the 2s orbital have spin quantum numbers, m_s but of opposite sign**
- If waves travelling at same speeds, matter waves have the shortest wavelength– **Alpha particle (He^{2+})**
- The number of angular nodes and radial nodes in 3s orbital are– **0 and 2, respectively**
- 4d, 5p, 5f and 6p orbitals are arranged in the order of decreasing energy– **5f > 6p > 5p > 4d**
- The series of transitions in the spectrum of hydrogen atom fall in visible region is– **Balmer series**
- Be^{2+} is isoelectronic with the ions– $\mathbf{Li^{+}}$
- The ion that is isoelectronic with CO is– $\mathbf{CN^{-}}$
- An isotone of ${}^{76}_{32}Ge$ is– $\mathbf{{}^{77}_{33}As}$
- Isoelectronic species are– $\mathbf{CO, CN^{-}, NO^{+}, C_2^{2-}}$
- .... ions has electronic configuration $[Ar]3d^6$– $\mathbf{Co^{3+}}$
- Atomic number and mass number of an element M are 25 and 52 respectively. The number of electrons, protons and neutrons in M^{2+} ion are respectively– **23, 25 and 27**
- The time taken by the electron in one complete revolution in the nth Bohr's orbit of the hydrogen atom is– **Directly proportional to n^3**

- According to the Bohr theory, the transition in the hydrogen atom will give rise to the least energetic photon– **n = 6 to n = 5**
- .... modified Bohr's theory by introducing elliptical orbits for electron path– **Sommerfield**
- The ratio of the energy required to remove an electron from the first three Bohr's orbits of hydrogen is– **36 : 9 : 4**
- The longest wavelength line in Balmer series of spectrum of H-atom– **656 nm**
- Total number of spectral lines in UV regions, during transition from 5^{th} excited state to 1^{st} excited state– **Zero**
- An electron jumps lower orbit to higher orbit, when– **Energy is absorbed**
- Electronic energy is negative because– **Energy is zero at infinite distance from the nucleus and decreases as the electron comes towards nucleus**
- Zeeman effect refers to the– **Splitting of the spectral lines in a magnetic field**
- The principal and azimuthal quantum number of electron in 4f orbitals are– **4, 3**
- In any sub-shell, the maximum number of electrons having same value of spin quantum number is– **$2l + 1$**
- Two electrons occupying the same orbital are distinguished by– **Spin quantum number**
- The orientation of an atomic orbital is governed by– **Magnetic quantum number**
- Maximum number of electrons in a subshell of an atom is determined by– **$4l + 2$**
- The subshell can accommodate as many as 10 electrons is– **d**
- A p-orbital can accommodate upto– **Two electrons**
- The orbital is with the four lobes present on the axis is– **$d_{x^2-y^2}$**
- Any f-orbital can accommodate upto– **2 electrons with opposite spin**
- The angular momentum of a p-electron is given as– $\frac{h}{\sqrt{2}\pi}$
- The pairs of d-orbitals will have electron density along the axes– **$d_{z^2}, d_{x^2-y^2}$**
- The total number of atomic orbitals in fourth energy level of an atom is– **16**
- The number of radial nodes in 4s and 3p orbitals are respectively– **3, 1**
- Radial nodes in 3s and 3p-orbitals are respectively– **2, 1**
- The number of lobes in most of the d-orbitals are– **4**
- The total number of subshells in fourth energy level of an atom is– **4**
- A transition element X has a configuration $(Ar)3d^4$ in its +3 oxidation state. Its atomic number is– **25**
- The ratio of charge to mass of an electron in coulombs per gram was determined by J.J. Thomson. He determined this ratio by measuring the deflection of cathode rays in electric and magnetic fields. The value he found for this ratio is– **-1.76×10^8 coulombs/g**
- The experiment that is responsible for finding out the charge on an electron– **Millikan's oil drop experiment**
- An element with mass number 81 contains 31.7% more neutrons as compared to protons. The symbol of the atom– **$^{81}_{35}Br$ –**
- The wavelength of visible light is– **380 nm – 760 nm**
- The spectrum of white light ranging from red to violet is called a continuous spectrum because– **The violet colour merges into blue, blue into green, green into yellow and so on**
- The electron in Bohr's model of hydrogen atom is pictured as revolving around the nucleus in order for it to– **Possess energy**
- The color corresponding to the wavelength of light emitted the electron in a hydrogen atom undergoes transition from n = 4 to n = 2 is– **Blue**
- The series of lines are the only lines in hydrogen spectrum that appear in the visible region– **Balmer**
- The third line of the Balmer series in the emission spectrum of the hydrogen atom is due to the transition from the– **Fifth Bohr orbit to the second Bohr orbit**
- The frequency of radiation absorbed or emitted the transition occurs between two stationary states with energies E_1 (lower) and E_2 (higher) is given by– $\nu = \frac{E_2 - E_1}{h}$
- The angular momentum of an electron in a given stationary state can be expressed as $m_e vr = n\frac{h}{2\pi}$. Based on this expression an electron can move only in those orbits for which its angular momentum is– **Integral multiple of $\frac{h}{2\pi}$**
- According to Bohr's theory, the angular momentum of an electron in 5^{th} orbit is– $\frac{2.5h}{\pi}$
- The radius of the stationary state that is also called Bohr radius is given by the expression $\gamma_n = n^2a_0$ where the value of a_0 is– **52.9 pm**
- If the radius of first Bohr orbit is x pm, then the radius of the third orbit would be– **(9 × x) pm**

- The longest wavelength doublet absorption transition is observed at 589 and 589.6 nm. Energy difference between two excited states is– **3.31×10^{-22} J**
- Bohr's theory can also be applied to the ions like– **He^+, Li^{2+}, Be^{3+}**
- According to Bohr's theory, the electronic energy of H-atom in Bohr's orbit is given by–

$$\mathbf{E_n = \frac{2.179 \times 10^{-18} \times Z^2}{\pi^2}\ J}$$

- The trend of energy of Bohr's orbits is– **Energy of the orbit increases as we move away from the nucleus**
- The negative electronic energy (negative sign for all values of energy) for hydrogen atom means is– **The energy of an electron in the atom is lower than the energy of a free electron at rest that is taken as zero**
- The energy of the electron in a hydrogen atom has a negative sign for all possible orbits because– **the electron is attracted by the nucleus and is present in orbit n, the energy is emitted and its energy is lowered**
- The probability of finding out an electron at a point within an atom is proportional to the– **Square of the orbital wave function i.e., Ψ^2**
- Two electron present in M shell will differ in– **Spin quantum number**
- The lowest value of n that allows orbital to exist is– **5**
- Total orbitals and electrons are associated with n = 4 are – **16, 32**
- An electron is in of the 3d-orbitals. The possible values of n, *l* and m_l for this electron is– **n = 3, *l* = 2, m_l = –2, –1, 0, + 1, + 2**
- The possible values of n, *l* and m_l for an atomic orbital 4*f* are– **n = 4, l = 3, m_l = –3, –2, –1, 0, + 1, +2, +3**
- Total electrons in an atom having the quantum numbers n= 4 and spin value= –1/2 is– **16**
- Total electrons are associated with the given set of quantum numbers n = 3 and *l* = 1 and m = –1are – **2**
- The orbital angular momentum of an electron in 2s-orbital is– **Zero**
- Two values of spin quantum numbers i.e., +1/2 and –1/2 represent – **Two quantum mechanical spin states which refer to the orientation of spin of the electron**
- The region where probability density function reduces to zero is called– **Nodal surfaces**
- The 3d-orbitals having electron density in all the three axis is– **$3d_{z^2}$**
- The number of radial nodes and angular nodes for d-orbital can be represented as– **(n–3) radial nodes + 2 angular nodes = (n – 1) total nodes**
- An electron can enter into the orbital when– **Value of (n + *l*) is minimum**
- Total number of orbitals in total are associated with n^{th} energy level is– **n^2**
- Effective nuclear charge (Z_{eff}) for a nucleus of an atom is defined as– **The net positive charge experienced by electron from the nucleus**
- The electronic configuration of O^{2-} ion is– **$1s^2\ 2s^2\ 2p^6$**
- The configuration of the valence orbital of an element with atomic number 22 is– **$4s^2\ 3d^2$**
- Three elements 'X', 'Y' and 'Z' have atomic numbers 18, 19 and 20 respectively. Total electrons present in the M shells of these elements are – **8, 8, 8**
- The electronic transition from n = 2 to n = 1 will produce shortest wavelength in– **Li^{2+} ion**
- The number of neutrons and electrons, respectively, present in the radioactive isotope of hydrogen is– **2 and 1**
- A certain orbital has no angular nodes and two radial nodes. The orbital is– **3s**
- The maximum number of electrons in a subshell is given by the expression– **4*l* + 2**

EXAM POINT

Sub–atomic particles and atomic models

The pair, of ions in isoelectronic with Al^{3+} is–	**O^{2-} and Mg^{2+}**	**JEE Main-25.06.2022, Shift-I**
Molecules contains an incomplete octet of the central atom–	**$AlCl_3$**	**Kerala CEE -03.07.2022**
The oxide contains an odd electron at the nitrogen atom is–	**NO_2**	**JEE Main-26.06.2022, Shift-II**
The difference between number of Neutrons and Protons is positive for–	**Tritium atom**	**MPPET-2013**
One atom of ${}^{39}_{19}K$ contains–	**19p; 20n and $19e^-$**	**AP-EAMCET/1991**

There are six electrons, six protons and six neutrons in an atom of an element. The atomic number of the element is– **6**	**NDA (II)-2016**
The atomic number of the element with symbol Uus is– **117**	**TS-EAMCET-2016**
The sum of the total number of neutrons present in protium, deuterium and tritium is– **3**	**TS-EAMCET (Engg.), 05.08.2021 Shift-II**
$_{20}Ca^{40}$ has magic number of **–** **Protons and Neutrons**	**AP EAMCET (Medical) - 1998**
The species that has the same number of electrons as $^{35}_{17}Cl$ is– $^{40}_{18}Ar^{+}$	**NDA (II)-2017**
The characteristics of elements X, Y and Z with atomic numbers, respectively, 33, 53 and 83 are– **X is a metalloid, Y is a non-metal and Z is a metal**	**JEE Main 16.03.2021, Shift-II**
The masses of an electron, a proton and a neutron respectively will be in the ratio– **1836.15 : 1838.68**	**AP EAPCET 20.08.2021 Shift-I**
Elements X and Y belong to the same group. 19, 55 Set of atomic numbers represent– **X and Y**	
The number of protons in a negatively charged atom (anion) is– **Less than the number of electrons in the atom**	**NDA (II)-2011**
Number of protons atomic number of – Element	**NDA (II)-2011**
Isotope used in brain scan is**–** $_6C^{11}$	**SRMJEEE-2010**
The number of electrons and neutrons of an element is 18 and 20 respectively. Its mass number is**–** **38**	**AIIMS-1994**
The number of electrons in $[_{19}K^{40}]^{-1}$ is– **20**	**AIIMS-1994**
Positron is**–** **Electron with positive charge**	**AIIMS-1998**
The nitride ion in lithium nitride is composed of– **7 protons + 10 electrons**	**CG PET -2018**
Isoelectronic pair**–** CN^-, O_3	**JCECE - 2013**
N_2 and CO are– **Isoelectronic**	**J & K CET-(2002)**
The symbol of the species with number of electrons, protons and neutrons as 18, 16 and 16 respectively is– $^{32}_{16}S^{2-}$	**AMU-2014**
Atomic number equal to the**–** **Number of the protons in the nucleus**	**AMU–2001**
The ratio of electron, proton and neutron in tritium is– **1 : 1 : 2**	**Assam CEE-2014**
The number of electrons, protons and neutrons in phosphide ion (P^{3-}) is**–** **18, 15, 16**	**Assam CEE-2021**
The energy released in an atom bomb explosion is mainly due to**–** **Lesser mass of products than initial material**	**BCECE-2006**
n/p ratio during positron decay**–** **Increases**	**CG PET- 2015**
If the de-Broglie wavelength of the electron in n^{th} Bohr orbit in a hydrogenic atom is equal to $1.5\pi a_0$ (a_0 is Bohr radius), then the value of n/Z is– **0.75**	**[JEE Main 2019, 12 Jan Shift-II]**
The introduction of a neutron into the nucleus of an atom would lead to a change in– **Atomic mass**	**CG PET -2019**
The element with atomic number 55 belongs to block of the periodic table is– ***s*-block**	**CG PET -2004**
Neutrons are found in atoms of all elements except in– **Hydrogen**	**CG PET -2004**
The triad of the nuclei that is isotonic**–** $_6C^{14}$, $_7N^{15}$, $_9F^{17}$	**HP CET-2018**
Three elements X, Y and Z are in the 3rd period of the periodic table. The oxides of X, Y and Z, respectively, are basic, amphoteric and acidic. The order of the atomic number of X, Y and Z is**–** **X < Y < Z**	**(JEE Main 2020, 2 Sep Shift-II)**
The group having isoelectronic species is– O^{2-}, F^-, Na^+, Mg^{2+}	**(JEE Main-2017)**
Sets of ions represents a collection of isoelectronic species– K^+, Cl^-, Ca^{2+}, Sc^{3+}	**Assam CEE-2020 (AIEEE 2006)**
According to the periodic law of elements, the variation in properties of elements is related to their– **Atomic numbers**	**(AIEEE 2003)**
The group number, number of valence electrons and valency of an element with atomic number 15, respectively, are– **15, 5 and 3**	**(JEE Main 2019, 12 April Shift-I)**
The isoelectronic set of ions is– N^{3-}, O^{2-}, F^- and Na^+	**(JEE Main 2019, 10 April Shift-I)**

The size of the iso-electronic species Cl^-, Ar and Ca^{2+} is affected by– **nuclear charge**	**(JEE Main 2019, 8 April Shift-I)**
The atomic number of unnilunium is– **101**	**(JEE Main 2020, 6 Sep Shift-II)**
Constitutes a group of the isoelectronic species are– NO^+, C_2^{2-}, CN^-, N_2	**JEE Main-09.10.2018**
Atoms with identical atomic number but different atomic mass number are known as– **Isotopes**	**J & K CET-(2014)**
Negatively charged particles are called– **Electrons**	**J & K CET-(2014)**
Mass number of an atom is the sum of– **Number of protons + number of neutrons**	**J & K CET-(2014)**
Mass of a proton is– **1.00727 amu.**	**J & K CET-(2014)**
$^{39}_{19}\mathbf{K}$ and $^{40}_{20}\mathbf{C}$ are– **Isotones**	**J & K CET-(2001)**
The specific heat of a metal is 0.11 and its equivalent weight is 18.61. Its exact atomic weight is– **55.83**	**J & K CET-(1998)**
Species is isotonic with $_{37}Rb^{86-}$ $_{38}\mathbf{Sr}^{87}$	**J & K CET-(1997)**
Atoms with same atomic number and different mass numbers are called– **Isotopes**	**JCECE - 2009**
The number of electrons, neutrons and protons in a species are equal to 10,8 and 8 respectively. The proper symbol of the species is– $^{16}_{8}\mathbf{O}^{2-}$	**JIPMER-2011**
In long form of periodic table the properties of the elements are a periodic function of their– **Atomic number**	**JIPMER-2010**
If two atoms have equal number of electron it is called– **Isoelectronic**	**JIPMER-2019**
The number of electrons, protons and neutrons in a species are equal to 10, 11 and 12 respectively. The proper symbol of the species is– $^{23}_{11}\mathbf{Na}^+$	**Kerala-CEE-2020**
1 u (amu) is equal to– $\mathbf{1.492\times10^{-10}\ J}$	**MHT CET-2010**
The number of protons, neutrons and electrons in $^{175}_{71}Lu$, respectively, are– **71, 104and 71**	**NEET-2020**
Isoelectronic speicies are– **CO, CN^-, NO^+, C_2^{2-}**	**AMU-2011 NEET-2000**
Atomic number of an element is equal to the number of– **Protons**	**UP CPMT-2005**
Unit positive charge and 1 amu mass is– **Proton**	**UP CPMT-2003**
The atomic number of an element is 17. The number of orbitals containing electron pairs in its valence shell is– **3**	**UP CPMT-2001**
The binding energy of an atom is 128 MeV. The binding energy per nucleon is 8, the number of nucleon is– **16**	**UP CPMT-2001**
Rutherford's alpha-particle scattering experiment was responsible for the discovery of– **Nucleus**	**NDA (I)-2017**
The number of periods present in the long form of the periodic table is– **7**	**AP-EAMCET (Med.)-1999**
The discovery of cathode rays are made up of electrons– **J. J. Thomson**	**MPPET- 2009**
When 4p orbital in any atom is filled completely, the next electron goes in– **5s**	**AP-EAMCET-1991**
According to Aufbau principle, the sub-shell is occupied by the electron, first has– **Lower energy**	**AP-EAMCET-1993**
Rutherford's experiment on scattering of α-particles showed for the first time that the atom has– **Nucleus**	**AP-EAMCET-1995**
In Rutherford's α-ray scattering experiment, the alpha particles are detected using a screen coated with– **Zinc sulphide**	**AP-EAMCET-1999**
The nucleus of an atom contains– **Proton and neutron**	**MPPET-2008**
"The properties of elements are periodic functions of their atomic weights." This periodic law was given by– **Mendeleev**	**AP EAMCET (Engg.) 17.09.2020 Shift-I**

The number of protons , neutrons and electrons in ${}^{13}_{6}C$ respectively are– **6, 7, 6**	**AP EAPCET 20.08.2021 Shift-I**
The wavelength of a spectral line emitted by hydrogen atom in the Lyman series is $\frac{16}{15R}$ cm. the value of n_2 (R = Rydberg constant)– **4**	**AIIMS-2011**
According to Moseley, a straight line group is obtained on plotting– **The square root of the frequencies of characteristics X-rays of elements against the atomic numbers**	**SRMJEEE – 2008**
Television picture tube is basically– **Cathode ray tube**	**AMU-2014**
The charge on an electron was discovered by– **Neil Bohr**	**BCECE-2004**
Rutherford's famous experiment with α- particles used this metal– **Au**	**BCECE-2009**
Transition of an electron in H-atom will emit maximum energy– $\mathbf{n_3 \longrightarrow n_2}$	**BCECE-2017**
The energy of an electron in n^{th} orbit of hydrogen atom is– $\mathbf{-\frac{13.6}{n^2} eV}$	**CG PET -2007**
For d-electron, the orbital angular momentum is– $\mathbf{\frac{\sqrt{6}\, h}{2\pi}}$	**J & K CET-(2004)**
Rutherford's experiment on the scattering of α-particles showed for the first time that the atom has– **Nucleus**	**UPTU/UPSEE-2005**

Development leading to the Bohr's model of atom

The longest wavelength present in Balmer series lines is [Given Rydberg constant = 1.097 x 10^7 m^{-1}]– **656 nm**	
The energy of an electromagnetic radiation is 19.875×10^{-13} erg. its wave number in cm^{-1} is – **10000** ($h=6.625\times10^{-27}$ erg-s; $c=3\times10^{10}$ cm s^{-1})	**AP-EAMCET-2002**
The energy of a photon is 3×10^{-12} erg. its wavelength in nm is – **662** ($h = 6.62 \times 10^{-27}$ erg-s, $c = 3 \times 10^{10}$ cm s^{-1})	**AP-EAMCET-2006**
The velocities of two particles A and B are 0.05 and 0.02 ms^{-1} respectively. The mass of B is five times the mass of A. The ratio of their de-Broglie's wavelength is– **2:1**	**AP-EAMCET-2008**
Two particles of masses m & 2m have equal kinetic energies. The de-Broglie wavelength are in the ratio of– $\mathbf{\sqrt{2} : 1}$	**AP EAPCET 23-08-2021 Shift-I**
With velocity must an electron travel so that its momentum is equal to that of a photon of wavelength 663 nm– **1098 m/s**	**AP EAPCET 23-08-2021 Shift-I**
The relation between the stopping potential (V_0) and frequency (ν) is correctly represented in [ϕ = Work function]– $\mathbf{V_0 = \frac{h\nu}{e} - \frac{\varphi}{e}}$	**TS-EAMCET (Engg.), 05.08.2021 Shift-II**
de Broglie was awarded the Nobel Prize in the year– **1929**	**TS EAMCET 10.08.2021, Shift-I**
One mole of alkene X on ozonolysis gave one mole of acetaldehyde and one mole of acetone. The IUPAC name of X is– **2-methyl-2butene**	**AP EAMCET (Engg.)-2009**
If the wavelength (λ) is equal to the distance travelled by the electron in one second h is the Planck's constant and m is the mass of electron $\mathbf{\lambda = \sqrt{h/m}}$	**TS EAMCET 04.08.2021, Shift-I**
If the energies of two light radiations E_1 and E_2 are 25 eV and 100 eV respectively, then their respective wavelength λ_1 and λ_2 would be in the ratio $\lambda_1 : \lambda_2$ = **4 : 1**	**AP EAPCET 19-08-2021, Shift-II**
De Broglie relationship has no significance for– **An iron ball.**	**SRMJEEE – 2009**
The wavelength associated with a particle of mass 3.313×10^{-31} kg moving with velocity 10^3 m/s is– $\mathbf{2 \times 10^{-6}}$ **m**	**SRMJEEE – 2010**

Frequencies of radiation (in Hz) has a wavelength of 600 nm– **5.0×10^{14}**	**AP-EAMCET- (Engg.)-2011**
If the kinetic energy of a particle is reduced to half, de-Broglie wavelength becomes– **$\sqrt{2}$ times**	**AP-EAMCET (Engg.) 2015**
The frequency of radiation emitted, when an electron falls from n = 3 to n = 1. in a hydrogen atom would be– **$2.92\times10^{15}s^{-1}$**	**AP- EAPCET- 07-09-2021, Shift-I**
Transitions of an electron in hydrogen atom emits radiation of the lowest wavelength **$n_2 = 2$ to $n_1 = 1$**	**AP-EAMCET- (Engg.) - 2010**
The basis of quantum mechanical model of an atom is– **Dual nature of electron**	**AP-EAMCET (Engg.) 2013**
The wave number of 4^{th} line in Balmer series of hydrogen spectrum is– (R = 1,09,677 cm^{-1}) **24,372 cm^{-1}**	**AP - EAMCET (Medical) - 2007**
The wavelengths of two photons are 2000Å and 4000Å respectively. The ratio of their energies– **2**	**VITEEE 2019**
The wavelengths of electron waves in two orbits is 3 : 5. The ratio of kinetic energy of electrons will be– **25 :9**	**VITEEE- 2009**
Ratio of energy of photon of wavelength 3000Å and 6000Å is– **2 : 1**	**AIIMS-2012**
The de Broglie wavelength associated with a ball of mass 1 kg having kinetic energy 0.5 J is– **6.626×10^{-34} m**	**AIIMS-2006**
The de- Broglie wavelength of an electron in the ground state of hydrogen atoms is– **0.3328nm** (K.E.= 13.6eV; 1ev=1.602×10^{-19} J)	**AIIMS-2000**
The wavelength of visible light is– **3800Å–7600Å**	**AIIMS-1998**
The de-Broglie wavelength of a particle with mass 1 g and velocity 100 m/s is– **6.63×10^{-33} m**	**NEET-1999**
If the Planck's constant h = 6.6×10^{-34} Js, the de Broglie wavelength of a particle having momentum of 3.3×10^{-24} kg ms^{-1} will be– **2Å**	**BITSAT 2018**
The energy of one mole of photons of radiation whose frequency is 5×10^{14} Hz will be– **199.51 KJ mol^{-1}**	**AMU-2015, 2007**
In hydrogen atom, the de Broglie wavelength of an electron in the second Bohr orbit is [Given that Bohr radius, a_0 =52.9 pm]– **211.6 π pm**	**NEET-Odisha 2019**
The mass of a photon with wavelength 3.6Å shall be– **61.35×10^{-34} kg**	**AMU-2006**
The de-Broglie wavelength (λ) associated with a photoelectron varies with the frequency (ν) of the incident radiation as, [ν_0 is threshold frequency]– $\lambda\ \mu\ \frac{1}{(\nu-\nu_0)^{\frac{1}{2}}}$	**[JEE Main 2019, 11 Jan Shift-II]**
The wavelength of a ball of mass 100 g moving with a velocity of 100 ms^{-1} be– **6.626×10^{-35} m**	**Assam CEE-2020**
The energy ratio of a photon of wavelength 3000 Å and 6000 Å is– **2 : 1**	**BCECE-2007**
The increasing order of wavelength for He^+ ion, neutron (n) and electron (e) particles, moving with the same velocity is– **$\lambda_{He^+} < \lambda_n < \lambda_e$**	**BCECE-2016**
The relationship between energy (E) of wavelengths 2000 Å and 8000 Å, respectively is– **$E_1 = 4E_2$**	**BCECE-2016**
Equations represent de- Broglie relation– $\lambda = \frac{h}{mv}$	**CG PET -2008 WB-JEE-2008 J & K CET-(1999) AIIMS-1994**
The wavelength of associated wave of a particle moving with a speed of one-tenth that of light is 7Å. The particle must be– **Electron**	**CG PET -2017**
A gas absorbs photon of 355 nm and emits at two wavelengths. If one of the emission is at 680 nm, the other is at– **743 nm**	**[AIEEE-2011]**

For emission line of atomic hydrogen from $n_i = 8$ to $n_f = n$, the plot of wave number (ν) against $\left(\frac{1}{n^2}\right)$ will be (The Rydberge constant, R_H is in wave number unit)– **linear with slope R_H**	**[JEE Main 2019, 9 Jan Shift-I]**
The de Broglie wavelength of particle is– **Inversely proportional to its momentum**	**J & K CET-(2012)**
If the de-Broglie wavelength of a particle of mass m is 100 times its velocity, then its value in terms of its mass (m) and planck's constant (h) is– $\mathbf{10\sqrt{\frac{h}{m}}}$	**J & K CET-(2009)**
The de-Broglie wavelength of helium atom at room temperature is– $\mathbf{7.34 \times 10^{-11}}$ **m**	**JCECE - 2013**
Dual nature of particle was given by– **de-Broglie equation**	**J&K CET (2010)** **JIPMER-2005**
The number of photons emitted per second by a 60 W source of monochromatic light of wavelength 663 nm is ($h = 6.63 \times 10^{-34}$ Js)– $\mathbf{2\times 10^{20}}$	**Kerala-CEE-2009**
The relationship between the energy E_1 of the radiation with a wavelength 8000 Å and the energy E_2 of the radiation with a wavelength 16000 Å is– $\mathbf{E_1 = 2E_2}$	**Kerala-CEE-2005**
The de Broglie wavelength of the matter wave associated with an object dropped from a height x, when it reaches the ground is proportional to– $\mathbf{\frac{1}{\sqrt{x}}}$	**Kerala-CEE-2020**
The energies E_1 and E_2 of two radiations are 25 eV and 50 eV respectively. The relation between their wavelengths i.e. λ_1 and λ_2 will be– $\mathbf{\lambda_1 = 2\lambda_2}$	**NEET-2011**
Time period of a wave is 5×10^{-3} sec what is the frequency– $\mathbf{2\times10^2\ s^{-1}}$	**UPTU/UPSEE-2008**
If the uncertainty in velocity of a moving object is 1.0×10^{-6} ms^{-1} and the uncertainty in its position is 58 m, The mass of this object is approximately equal to that of– **electron** ($h = 6.626\times10^{-34}$ Js)	**AP EAMCET (Medical) - 2013**
If the uncertainty in momentum and uncertainty in the position of a particle are equal. then the uncertaintiy in its velocity would be given by– $\mathbf{\Delta v \geq \frac{1}{2m}\sqrt{\frac{h}{\pi}}}$	**AP EAPCET 24.08.2021, Shift-I** **CG PET -2019**
Both the position and exact velocity of an electron in an atom cannot be determined simultaneously and accurately. This is known as– **Heisenberg uncertainty principle**	**TS-EAMCET 09.08.2021, Shift-I**
Heisenberg's uncertainty principle is in general significant to– **Micro particles having a very high speed**	**TS EAMCET 04.08.2021, Shift-I**
The Heisenberg uncertainty principle may be stated as– $\mathbf{\Delta x.\Delta v \geq h/4\pi m}$	**WB-JEE-2012, AMU-2004**
The de Broglie wavelength of an electron in the 4th Bohr orbit is– $\mathbf{8\pi a_0}$	**[JEE Main 2020, 9 Jan Shift-I]**
The energy of a photon is 3×10^{-12} erg. Its wavelength in nm is – **662**	**JCECE - 2009**
The de-Broglie wavelength of a particle with mass 1 kg and velocity 100 m/s is– $\mathbf{6.6 \times 10^{-36}}$ **m**	**JIPMER-2008, JCECE - 2007** **AP-EAMCET (Engg.) 1997, 1996** **AP – EAMCET - (Medical)-1997** **NEET-1999**
Uncertainty principle is valid for– **Proton**	**Kerala-CEE-2017**
The ratio of de-Broglie wavelengths for electrons accelerated through 200 V and 50 V is– **1 : 2**	**Manipal-2020**

If uncertainty in position and velocity are equal, then uncertainty in momentum will be– **$\frac{1}{2}\sqrt{\frac{mh}{\pi}}$**	**Manipal-2018**
If uncertainty in position and momentum are equal, then uncertainty in velocity is– **$\frac{1}{2m}\sqrt{\frac{h}{\pi}}$**	**NEET-2008**
If E_e, E_α and E_p represent the kinetic energies of an electron, α-particle and a proton respectively each moving with same de-Broglie wavelength then– **$E_e > E_p > E_\alpha$**	**UP CPMT-2011**
Series of lines is found in the UV region of atomic spectrum of hydrogen– **Lyman**	**AP-EAMCET-1991**
Among the first lines of Lyman, Balmer, Paschen and Brackett series in hydrogen atomic spectra, the highest energy has – **Lyman**	**AP-EAMCET-1999**
The values of n_1 and n_2 for the 2^{nd} line in the Lyman series of hydrogen atomic spectrum is – **1 and 3**	**AP-EAMCET-2000**
The wavelength of spectral line emitted by hydrogen atom in the Lyman series is $\frac{16}{15R}$ cm. The value of n_2 (R=Rydberg constant)– **4**	**AP-EAMCET-2007**
The ratio of the highest to the lowest wavelength of Lyman series is– **4 : 3**	**TS-EAMCET (Engg.) 05.08.2021 Shift-II**
Extracted through alloy formation– **Silver**	**SCRA - 2009**
The spectrum of Helium is expected to be similar to that of– **Li^+**	**AP EAPCET 19-08-2021 Shift-I** **NEET-1998**
Electron transitions in the H-atom will release the largest amount of energy– **n=2 to n=1**	**COMEDK-2012**
The first emission line on hydrogen atomic spectrum in the Balmer series appears at (R = Rydberg constant)– **$\frac{5R}{36}$ cm^{-1}**	**AP-EAMCET (Medical), 2006** **AP EAMCET (Medical) - 1998** **AP-EAMCET (Engg.) - 1998**
The values of n_1 and n_2 respectively for H_β line in the Lyman series of hydrogen atomic spectrum are– **1 and 3**	**AP-EAMCET (Medical), 2006**
The frequency of light emitted for the transition n = 4 to n = 2 of He^+ is equal to the transition in H atom corresponding– **n = 2 to n = 1**	**AIEEE-2011**
Orbitals will have zero probability of finding the electron in the yz plane– **p_x**	**WB-JEE-2010**
$\left({}_{32}Ge^{76}, {}_{34}Se^{76}\right)$ and $({}_{14}Si^{30}, {}_{16}S^{32})$ are examples of– **isobars and isotones**	**WB-JEE-2014**
${}_{19}K^{40}$ and ${}_{20}Ca^{40}$ are known as– **isobars**	**UP CPMT-2002**
O_2 and O_3 are– **allotropes**	**UP CPMT-2010**
An isobar of ${}_{20}Ca^{40}$ is– **${}_{18}Ar^{40}$**	**MHT CET-2008**
Isotones have– **same number of neutrons**	**UP CPMT-2010**
Isoelectronic is– **CN^-, CO**	**NEET-2002**
Cl^-, Ar, Ca^{2+}, Ti^{4+} clement represents is– **Isoelectronic sequence**	**AP-EAMCET (Medical), 2006**

Hydrogen Atom

If the radius of the 3rd Bohr's orbit of hydrogen atom is r_3 and the radius of 4th Bohr's orbit is r_4. Then:– $\mathbf{r_4 = \frac{16}{9} r_3}$	**JEE Main-26.06.2022, Shift-I**
The hydrogen line spectrum provides evidence for the– **Quantized nature of atomic energy states**	**SCRA-2012**
The energy of an electrons in the 3rd orbit of an atom is –E. The energy of an electron in the first orbit will be– **–9E**	**MPPET- 2009**
The velocity of an electron in the first Bohr orbit is v_1. Its velocity in the third Bohr's orbit is– $\mathbf{v_1/3}$	**SCRA-2010**
The energy of the electron in the hydrogen atom is given by the expression :– $\mathbf{\frac{-2\pi^2 Z^2 e^4}{n^2 h^2}}$	**AP-EAMCET-1991**
The basic assumption of Bohr's model of hydrogen atom is that : **the angular momentum of the electron is quantised**	**AP-EAMCET-1994**
The radius of the second Bohr's orbit is :– **0.212 nm**	**AP-EAMCET-1995**
In the Bohr hydrogen atom, the electronic transition emiting light of longest wavelength is:– **n = 4 to n = 3**	**AP-EAMCET-1997**
The energy of an electron present in Bohr's second orbit of hydrogen atom is :– **– 328 kJ mol^{-1}**	**AP EAMCET (Engg.) 2001**
An electron is moving in Bohr's fourth orbit. Its de-Broglie wavelength is λ. The circumference of the fourth orbit is– **4λ**	**VITEEE-2014**
The energy (in ev) associated with the electron in the 1st orbit of Li^{2+} is– **– 122.4**	**TS-EAMCET (Engg.), 07.08.2021 Shift-II**
If the wavelength of the first line of Balmer series is 656 nm, then the wavelengths of its second line and limiting line respectively are ——— **485.9 nm & 364.4 nm**	**AP EAPCET 25.08.2021, Shift-II**
The electron in the hydrogen jump on absorbing 12.75 eV of energy would jump to ____orbit– **4**	**AP EAPCET 24.08.2021 Shift-II**
On the basis of Bohr's model. The radius of the 3rd orbit is– **9 times the radius of 1st orbit**	**AP EAPCET 19-08-2021 Shift-I**
Energy associated with the first orbit of He^+ is– $\mathbf{-8.72\times10^{-18}}$ **joules**	**COMEDK-2015 AMU-2015**
Assuming Rydberg constants are equal, the ground state energy of the electron in hydrogen atom is equal to– **the first excited state energy of the electronic He^+**	**COMEDK-2020**
The wavelength (in Å) of an emission line obtained for Li^{2+} during an electronic transition from $n_2 = 2$ to $n_1 = 1$ is (R = Rydberg constant)– $\mathbf{\frac{4}{27R}}$	**AP-EAMCET (Medical), 2008**
The ratio of potential energy (PE) and total energy of an electron in a Bohr orbit of the hydrogen atom is– 2	**TS-EAMCET 09.08.2021, Shift-I**
The maximum energy is possessed by an electron, when it is present– **at infinite distance from the nucleus**	**AIIMS-1996**
In second orbit of H atom the velocity of e^- is:– $\mathbf{10.9\times10^5}$ **m/sec**	**AIIMS-27 May, 2018 AIIMS-2001**
In hydrogen atomic spectrum, a series limit is found at 12186.3 cm^{-1}. Then, it belongs to– **Paschen series**	**AIIMS-2014**
If velocity of an electron in the first Bohr orbit of H is v_1 then velocity in second orbit will be– $\mathbf{\frac{v_1}{2}}$	**SRMJEEE – 2007**
If the energy of an electron in the second Bohr orbit of H-atom is –E, the energy of the electron in the Bohr's first orbit is– **–4E**	**SRMJEEE – 2010**
In a hydrogen atom, the electron is at a distance of 4.768 Å from the nucleus. The angular momentum of the electron is– $\mathbf{\frac{3h}{2\pi}}$	**AP- EAMCET(Medical) - 2010**

According to Bohr's theory, the angular momentum for an electron of 3rd orbit is– **$3\hbar$**	**VITEEE 2014**
In the hydrogen transition spectrum would have the same wavelength as the Balmer transition, n = 4 to n = 2 of He^+ spectrum– **n = 2 to n = 1**	**VITEEE-2013**
The degeneracy of the level of H-atom that has energy $\left(-\frac{R_H}{9}\right)$ is– **9**	**VITEEE 2013**
The energy of electron in n^{th} orbit of hydrogen atom is– **$-\frac{13.6}{n^2}$ eV**	**AMU EXPLORER-2002** **Karnataka-CET-2016**
The spectrum of H^+ is expected to be similar to that of– **He^+**	**AMU EXPLORER-2002**
The ratio of energy of the electron in ground state of hydrogen to the electron in first excited state of Be^{3+} is– **1 : 4**	**Assam CEE-2014**
The energy of an electron in second Bohr orbit of hydrogen atom is– **-5.44×10^{-19} J**	**AIIMS 26 May 2019 (Evening)** **BITSAT 2017** **BCECE-2010**
The wave number of the spectral line in the emission spectrum of hydrogen will be equal to 8/9 times the Rydberg's constant if the electron jumps from– **n = 3 to n = 1**	**BCECE-2014**
The wave number of the limiting line in Lyman series of hydrogen is 109678 cm^{-1}. The wave number of the limiting line in Balmer series of He^+ would be:– **109678 cm^{-1}**	**BITSAT-2014**
If the radius of H is 0.53 Å, then the radius of $_3Li^{2+}$ is– **0.17 Å**	**BITSAT-2012**
The first emission line in the atomic spectrum of hydrogen in the Balmer series appears at– **$\frac{5R}{36}$ cm^{-1}**	**BITSAT-2016**
Bohr's radius of 2^{nd} orbit of Be^{3+} is equal to that of– **first orbit of hydrogen**	**CG PET -2009**
The radius of the second Bohr orbit in terms of the Bohr radius, a_0, in Li^{2+} is– **$\frac{4a_0}{3}$**	**[JEE Main 2020, 8 Jan Shift-II]**
Bohr model of hydrogen atom was unable to explain– **Heisenberg's uncertainty principle**	**J & K CET-(2012)**
Energy of one mole of photons of radiation whose frequency is 5×10^{14} Hz is– **199.51 kJ mol^{-1}**	**J & K CET-(2014)**
The value of Rydberg constant is– **109678 cm^{-1}**	**J & K CET-(2007)**
The wavelength of a spectral line in Lyman series, when electron jumping back to 2^{nd} orbit, is– **1216**	**J & K CET-(2007)**
The value of n_l in the relationship is $\frac{1}{\lambda} = R_H\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$ is correct when $n_2 > n_1$ corresponds to Paschen lines in the Hydrogen spectrum– **3**	**J & K CET-(2001)**
Transition from n=4, 5, 6 to n = 3 in hydrogen spectrum gives– **Paschen series**	**J & K CET-(2000)**
The expression of angular momentum of an electron in a Bohr's orbit is:– **$\frac{nh}{2\pi}$**	**JCECE - 2003**
Ratio of kinetic energy of hydrogen and helium gas at 300 K is :– **1 : 1**	**JCECE - 2006**
When an electron in hydrogen spectrum jumps from n = 7 to n = 2, the total number of spectral lines possible are– **15**	**JCECE - 2016**
An electron is moving in Bohr's fourth orbit. Its de-Broglie wave length is λ. The circumference of the fourth orbits is– **4λ**	**JIPMER-2014**
The ratio of the difference in energy between the first and the second Bohr orbit to that between the second and the third Bohr orbit is– **27/5**	**JIPMER-2012**
Ratio of radii of second and first Bohr orbits of H atom is– **4**	**JIPMER-2005**
The number of waves formed by a Bohr electron in one complete revolution in its second orbit is– **Two**	**JIPMER-2016**

If the energies of the two photons in the ratio of 3 : 2, their wavelength will be in the ratio of– **2 : 3**	**Karnataka-CET-2011**
The radius of the first Bohr orbit of hydrogen atom is 0.529Å. The radius of the third orbit of H^+ will be– **4.29Å**	**Kerala-CEE-2007**
The ratio of frequency corresponding to the third line in Lyman series of hydrogen atomic spectrum to that of the first line in Balmer series of Li^{2+} spectrum is– $\mathbf{\frac{3}{4}}$	**Kerala-CEE-2012**
The shortest wavelength of the line in hydrogen atomic spectrum of Lyman series when $R_H = 109678\ cm^{-1}$ is– **911.7 Å**	**Kerala-CEE-2014**
In the hydrogen atom spectrum, the emission of the least energetic photon taken place during the transition from n= 6 energy level to n = ...energy level.– **5**	**Kerala-CEE-2016**
The energy of an electron is the 3s orbital (excited state) of H – atom is– **–1.5eV**	**Kerala-CEE-2017**
In the atomic spectrum of hydrogen, the spectral lines pertaining to electronic transition of n = 4 to n = 2 refers to :– **Balmer series**	**Manipal-2018**
If r is the radius of the first orbit, the radius of n^{th} orbit of H-atom is given by– $\mathbf{rn^2}$	**NEET-1988**
The energy of an electron in the n^{th} Bohr orbit of hydrogen atom is– $\mathbf{-\frac{13.6}{n^2}\ eV}$	**NEET-1992**
The modified Bohr's theory by introduction elliptical orbits for electrons path– **Sommerfeld**	**NEET-1999**
The energy of second Bohr orbit of the hydrogen atom is $-328\ kJ\ mol^{-1}$. hence the energy of fourth Bohr orbit would be– $\mathbf{-82\ kj\ mol^{-1}}$	**NEET-2005**
Number of spectral lines of Lyman series of electron when it jumps from 6 to first level (in Lyman series), is– **15**	**UP CPMT-2009**
The wave number of 4^{th} line in Balmer series of hydrogen spectrum is– ($R = 1,09,677\ cm^{-1}$)– $\mathbf{24,372\ cm^{-1}}$	**UP CPMT-2008**
The energy of second Bohr orbit of the hydrogen atom is $-328\ kJ\ mol^{-1}$; hence the energy of fourth Bohr orbit would be– $\mathbf{-82\ kJ\ mol^{-1}}$	**UPTU/UPSEE-2007**
The wavelength of the radiation emitted, when in a hydrogen atom electron falls from infinity to stationary state, would be (Rydberg constant = $1.097 \times 10^7\ m^{-1}$)– **91 nm**	**UPTU/UPSEE-2007**
The radius of hydrogen atom in the ground state is 0.53Å.The radius of Li^{2+} ion (atomic number = 3) in a similar state is:– **0.176Å**	**UPTU/UPSEE-2014, 2005**
For a Bohr atom angular momentum M of the electron is : (n=0,1,2,....)– $\mathbf{\frac{nh}{2\pi}}$	**UPTU/UPSEE-2005**
The ratio of the difference in energy between the first and second Bohr orbit to that between the second and third Bohr orbit is– $\mathbf{\frac{27}{5}}$	**UPTU/UPSEE-2013**
An electron from one Bohr stationary orbit can go to next higher orbit– **by absorption of electromagnetic radiation of particular frequency**	**UPTU/UPSEE-2008**
For the Paschen series the values of n_1 and n_2 in the expression $\Delta E = R_H c\left(\frac{1}{n_1^2}-\frac{1}{n_2^2}\right)$– $\mathbf{n_1=3, n_2=4,5,6,\ldots}$	**WB-JEE-2009**
In Sommerfeld's modification of Bohr's theory, the trajectory of an electron in a hydrogen atom is– **a perfect ellipse**	**WB-JEE-2010**
The electronic transitions from n = 2 to n = 1 will produce shortest wavelength in (Where n = principal quantum state)– $\mathbf{Li^{2+}}$	**WB-JEE-2011**
The energy of an electron in first Bohr orbit of H-atoms is 13.6 eV. the possible energy value of electron in the excited state of Li^{2+} is– **–30.6 eV**	**WB-JEE-2011**
The emission spectrum of hydrogen discovered first and the region of the electromagnetic spectrum in it belongs, respectively are– **Balmer, visible**	**WB-JEE-2014**

The time taken for an electron to complete one revolution in Bohr orbit of hydrogen atom is– $\mathbf{\frac{4\pi^2mr^2}{nh}}$	**WB-JEE-2016**
The ratio of the shortest wavelength of two spectral series of hydrogen spectrum is found to be about 9. The spectral series are– **Lyman and Paschen**	**[JEE Main 2019, 10 April Shift-II]**
The shortest wavelength of H atom in the Lyman series is λ_1. The longest wavelength in the Balmer series of He^+ is– $\mathbf{\frac{9\lambda_1}{5}}$	**[JEE Main 2020, Sep Shift-II]**
The values of n_1 and n_2 respectively for H_β line in the Lyman series of hydrogen atomic spectrum 44 are– **1 and 3**	**JIPMER-2009**
X-rays are electromagnetic radiation whose wavelengths are of the order of:– $\mathbf{10^{-10}}$ **metre**	**NDA (II)-2015**
The shortest wavelength in hydrogen spectrum of Lyman series when R_H = 109678 cm^{-1}, is– **911.7Å**	**Kerala-CEE-2010**
The longest wavelength line in Balmer series of spectrum is– **656 nm**	**NEET-1996**
The wave number of hydrogen atom in Lymen series is 82200 cm^{-1}. The electron goes from– $\mathbf{n_2 \rightarrow n_1}$	**UPTU/UPSEE-2013**
Splitting of spectrum lines in magnetic field is– **Zeeman effect**	**UPTU/UPSEE-2008**
In hydrogen spectrum, the series of lines appearing in ultra violet region of electromagnetic spectrum are called :– **Lyman lines**	**Manipal-2017**
Towards quantum mechanical model of the atom.	
The electronic configuration of Pt (atomic number 78) is– **[Xe]** $\mathbf{4f^{14}5d^9\,6s^1}$	**JEE Main-29.06.2022, Shift-I**
The number of nodal planes present in *s antibonding orbitals is– **1**	**Karnataka-CET, 2008**
Mg^{2+} is isoelectronic with– $\mathbf{Na^+}$	**Karnataka-CET-2007**
How many electrons are present in the M shell of the atom of an element with atomic number 24– **13**	**AP-EAMCET (Med.)-1999**
The symbol of the element 'Tungeston' is– **W**	**NDA (II)-2015**
Electronic configuration of potassium is– $\mathbf{1s^2,2s^2,2p^6,3s^2,3p^6,4s^1}$	**AP EAMCET- 1992**
Chlorine atom, in its third excited state, reacts with fluorine to form a compound X. The formula and shape of X are– $\mathbf{ClF_7}$**, pentagonal bipyramidal**	**AP EAMCET- 2003**
The electronic configuration of curium (Z = 96) is– **[Rn]** $\mathbf{5f^7\,6d^1\,7s^2}$	**JHARKHAND – 2019**
The number of unpaired electrons in carbon atom is– **Two**	**MPPET- 2009**
In the change of NO^+ to NO, the electron is added to a– **π* orbital**	**SCRA 2010**
The maximum number of electrons that can be accommodated in all the orbitals for l = 3, is– **14**	**AP-EAMCET-1991**
The rule that explains the reason for chromium to have [Ar] $3d^5$, $4s^1$ configuration instead of [Ar] $3d^4$, $4s^2$, is– **Hund's rule**	**AP-EAMCET-1996**
The electronic configuration of sodium is– **[Ne]** $\mathbf{3s^1}$	**AP-EAMCET-1999**
In the ground state, an element has 13 electrons in M shell. The element is– **Chromium**	**AP-EAMCET-2001**
If the electron of a hydrogen atom is present in the first orbit, the total energy of the electron is– $\mathbf{\frac{-e^2}{2r}}$	**AP-EAMCET-2003**
Elements have least number of electrons in its M shell– **K**	**AP-EAMCET-2004**
The atomic numbers of elements X, Y and Z are 19, 21 and 25 respectively. The number of electrons present in the M shell of these elements, the order is– **Z > Y > X**	**AP-EAMCET-2005**
The maximum number of sub-levels, orbitals and electrons in N shell of an atom are respectively– **4, 16, 32**	**AP-EAMCET-2007**
Orbital has zero radial nodes and 2 angular nodes– **3d**	**AP EAPCET 23-08-2021 Shift-I**

Pair are the ions isoelectronic–	Na^-, O^{2-}	NDA (I)-2019
The element with the electronic configuration $1s^22s^22p^63s^23p^63d^{10}4s^1$ is–	Cu	TS-EAMCET-2016
The number of unpaired electrons in Co^{2+}, is–	3	TS-EAMCET (Engg.), 07.08.2021 Shift-II
$[Ar]3d^{10}4s^1$ electronic configuration belongs to–	Cu	MPPET-2008
The electronic configuration of Cs is –	$[Xe]6s^1$	AP EAMCET (Engg.) 21.09.2020, Shift-II
The element with atomic number 12 belongs to .... group and .... period–	II A, third	AP EAMCET (Engg.) 2001
Electronic configuration of X is $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^1$. It belongs to–	thirteenth group and third period	COMEDK-2017
An orbital with n=3, ℓ=1 is designated as–	3p	COMEDK-2014
The total number of orbitals in the fifth energy …….is–	25	AP-EAMCET (Medical), 2006
The atomic number of an element is 35. What is the total number of electrons present in all the p-orbitals of the ground state atom of that element–	17	AP-EAMCET (Medical), 2003
The total number of electrons present in all the 's' orbitals, all the 'p' orbitals and all the 'd' orbitals of cesium ion are respectively–	10, 24, 20	AP-EAMCET (Medical), 2003
An orbital with one angular node shows three maxima in its radial probability distribution curve, the orbital–	4p	TS EAMCET 05.08.2021, Shift-I
Spectrum of Li^{2+} is similar to that of–	H	AIIMS-2002
Element is represented by electronic configuration– $1s^2 2s^2 2p_x^1\ 2p_y^1 2p_z^1$	Nitrogen	AIIMS-2001
The outermost configuration of most electronegative element is–	$ns^2\ np^5$	AIIMS-2000
The configuration $1s^2, 2s^2 2p^5, 3s^1$ shows:–	Excited state of neon atom	AIIMS-1997
Transition metal elements exhibit general electronic configuration–	$ns^{1-2}\ (n-1)\ d^{1-10}$	AP- EAPCET- 07-09-2021, Shift-I
The atomic number of an element 'M' is 26. How many electrons are present in the M-shell of the element in its M^{3+} state–	13	AP - EAMCET (Medical) - 2007
The orbital angular momentum of an electron in 2p orbital is–	$\sqrt{2}\ h/2\pi$	Assam CEE-2019
The orbital angular momentum of a p-electron given as–	$\frac{h}{\sqrt{2}\pi}$	NEET-Mains 2012
Orbital having 3 angular nodes and 3 total nodes to–	4f	Odisha NEET-2019
The number of radial nodes of 3s and 2p orbitals are respectively–	2, 0	BITSAT-2017
The element whose electronic configuration is $1s^2\ 2s^2\ 2p^6\ 3s^2$ is a–	metal	AMU-2004
The electronic configuration of P in $H_3\ PO_4$–	$1s^2 2s^2, 2p^6, 3s^2 3p^6$	CG PET- 2011
The pair having the similar shape is–	BF_4^- and NH_4^+	CG PET- 2011
Quantum numbers ℓ = 2and m = 0 represent the orbital–	d_{z^2}	CG PET- 2016
Electronic configuration of H^+ is–	$1s^0$	CG PET- 2010
The electronic configuration of bivalent europium and trivalent cerium are (atomic number : Xe = 54, Ce = 58, Eu = 63)–	$[Xe]4f^7$ and $[Xe]4f^1$	(JEE Main 2020, 9 Jan Shift-I)
In the sixth period, the orbitals that are filled are–	6s, 4f, 5d, 6p	(JEE Main 2020, 5 Sep Shift-I)
Outermost electronic configuration of a group-13 element E is $4s^2\ 4p^1$. The electronic configuration of an element of p-block period-five placed diagonally to element, E is–	$[Kr]4d^{10}5s^25p^2$	(JEE Main 2021, 20 July Shift-II)