

## Lesson Plan of 1<sup>st</sup> Semester

| <b>Lesson Plan of 1<sup>st</sup> Semester</b> |  |                           |
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| <b>Name of the Teacher: Hemant Kumar</b>      | <b>Class: B.Sc. (N.M.)</b>   | <b>Subject: Chemistry</b> |
| 16-08-2022 To<br>20-08-2022                   | Review of Bohr's theory and its limitations, dual behaviour of matter and radiation, de Broglie's relation, Heisenberg uncertainty principle   |                           |
| 22-08-2022 To<br>27-08-2022                   | Hydrogen atom spectra, what is Quantum Mechanics? Time independent Schrodinger equation and meaning of various terms in it. Significance of $\psi$ and $\psi^2$ , Schrodinger equation for hydrogen atom   |                           |
| 29-08-2022 To<br>03-09-2022                   | Radial and angular parts of the hydrogenic wave functions and their variations 1s, 2s, 2p, 3s, 3p and 3d orbitals (only graphical representation) Radial and angular nodes and their significance, Radial distribution functions and concept of the most probable distance with special reference to 1s and 2s atomic orbitals |                           |
| 05-09-2022 To<br>10-09-2022                   | Significance of quantum numbers, orbital angular momentum and Quantum numbers $m_l$ and $m_s$ , shapes of s, p and d atomic orbitals, nodal planes. Discovery of spin, spin quantum number ( $s$ ) and magnetic spin quantum number ( $m_s$ )  |                           |
| 12-09-2022 To<br>17-09-2022                   | Review of ionic bonding: General characteristic and energy consideration in ionic bonding, Lattice energy and solvation energy and their importance in the context of stability and solubility of ionic compounds.   |                           |
| 19-09-2022 To<br>24-09-2022                   | Statement of Born-Landé equation for calculation of lattice energy, Born-Haber cycle and its applications, polarizing power and polarizability, Fajan's rules, ionic character in covalent compounds bond movement dipole moment and percentage ionic character  |                           |
| 26-09-2022 To<br>01-10-2022                   | Covalent bonding: VB approach - shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable example of linear, trigonal planer, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements   |                           |
| 3-10-2022 To<br>8-10-2022                     | MO approach: Rules for the LCAO method, bonding and anti bonding MOs and their characteristic for s-s, s-p and p-p combinations of atomic orbitals, non-bonding combination of orbitals  |                           |
| 10-10-2022 To<br>15-10-2022                   | MO treatment of homonuclear diatomic molecules of 1 <sup>st</sup> and 2 <sup>nd</sup> periods and hetronuclear diatomic molecules such as CO, NO and NO <sup>+</sup> , comparison of VB and MO approaches  |                           |
| 17-10-2022 To<br>21-10-2022                   | Postulates of Kinetic theory of gases and derivation of the Kinetic gas equation, deviation of real gases from ideal behaviour, compressibility factor causes of deviation   |                           |

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| 22-10-2022 To<br>30-10-2022 | Van der Waals equation of state for real gases, Boyle temperature, critical phenomena, critical constants and their calculation from Van der Waals equation, Andrews isotherm of CO <sub>2</sub>  |
| 31-10-2022 To<br>05-11-2022 | Maxwell Boltzmann distribution law of molecular velocities and molecular energies and their importance, temperature dependence of these distributions. Most probable, average and root mean square velocities.                                      |
| 07-11-2022 To<br>12-11-2022 | Collision cross section, collision number, collision frequency, collision diameter and mean free path of molecules. Viscosity of gases and effect of temperature and pressure on coefficient of viscosity.  |
| 14-11-2022 To<br>19-11-2022 | Liquids: Surface tension and its determination using Stalagmometer, Viscosity of a liquid and determination of coefficient of viscosity using Ostwald's viscometer, effect of temperature on surface tension and coefficient of viscosity of liquid |
| 21-11-2022 To<br>26-11-2022 | Forms of solids, symmetry elements, unit cells, crystal systems, Bravais lattice types and identification of lattice planes.  |
| 28-11-2022 To<br>03-12-2022 | Law of crystallography - Law of constancy of interfacial angle, law of rational indices.  |
| 05-12-2022 To<br>10-12-2022 | X-ray diffraction by crystals, Bragg's law, structure of NaCl, KCl and CsCl, defects in crystals. Glasses and liquid crystals.  |
| 12-12-2022 To<br>17-12-2022 | Revision  |