# महाराणा प्रताप पी.जी. कालेज, जंगल धूसड़, गोरखपुर

**Class : M.Sc. I[st] Sem.** **LESSION PLAN : 2019-20** **Subject : Chemistry**

| DATE | LECTURE | TEACHER'S NAME | PAPER | CHAPTER | TOPIC |
|---|---|---|---|---|---|
| 01.08.2019 | 1 | Sanjay Jaiswal | I | Molecular Symmetry | Symmetry Elements |
| | 1 | Dr. R. Sahay | II | Fundamental Concepts | Introduction ,Operators |
| 02.08.2019 | 2 | Sanjay Jaiswal | I | Molecular Symmetry | Symmetry Elements |
| | 2 | Dr. R. Sahay | II | Fundamental Concepts | Algebra of Operators , Commut, Linear and Vector operators |
| 03.08.2019 | 3 | Sanjay Jaiswal | I | Molecular Symmetry | Symmetry operation |
| | 3 | Dr. R. Sahay | II | Fundamental Concepts | Laplacian and Hermition operators |
| 06.08.2019 | 1 | Pradeep Verma | III | Stereochemistry of bonding in main group component | dπ pπ bonds |
| | 1 | Priyanka Mishra | IV | Elimination reaction | E1 reactions |
| 07.08.2019 | 2 | Pradeep Verma | III | Stereochemistry of bonding in main group component | Bents rule |
| | 2 | Priyanka Mishra | IV | Elimination reaction | E1 mechanism |
| 08.08.2019 | | Pradeep Verma | CT | | |
| | 3 | Priyanka Mishra | IV | Elimination reaction | E2 reactions |
| 09.08.2019 | 4 | Sanjay Jaiswal | I | Molecular Symmetry | Symmetry operation with special reference to water molecules |
| | 4 | Dr. R. Sahay | II | Fundamental Concepts | Laplacian operators |
| 10.08.2019 | 5 | Sanjay Jaiswal | I | Molecular Symmetry | Symmetry operation with special reference to ethane molecules |
| | 5 | Dr. R. Sahay | II | Fundamental Concepts | Concept of normalisation and orthoganality |
| 13.08.2019 | 6 | Sanjay Jaiswal | I | Molecular Symmetry | Classification Of Molecules / Ion Based On Their Symmetry Property |
| | 6 | Dr. R. Sahay | II | Fundamental Concepts | Concept of normalisation and orthoganality |
| 14.08.2019 | 3 | Pradeep Verma | III | Stereochemistry of bonding in main group component | Energetics of Hybridisation |
| | 4 | Dr. S. K. Vernwal | IV | Substitution reaction | General view, Arenium ion mechanism(ArSE) |
| 16.08.2019 | 4 | Pradeep Verma | III | Stereochemistry of bonding in main group component | Energetics of Hybridisation |
| | 5 | Priyanka Mishra | IV | Elimination reaction | E2 mechanism |
| 17.08.2019 | 5 | Pradeep Verma | III | Stereochemistry of bonding in main group component | Polyether complexes of alakali metals |
| | | Priyanka Mishra | CT | | |
| 19.08.2019 | 7 | Sanjay Jaiswal | I | Molecular Symmetry | Classification Of Molecules / Ion Based On Their Symmetry Property |
| | 7 | Dr. R. Sahay | II | Fundamental Concepts | Postulate of quantum mechanics |
| 20.08.2019 | 8 | Sanjay Jaiswal | I | Molecular Symmetry | Classification Of Molecules / Ion Based On Their Symmetry Property |
| | 8 | Dr. R. Sahay | II | Fundamental Concepts | Schrodinger wave equation |
| 21.08.2019 | 9 | Sanjay Jaiswal | I | Molecular Symmetry | Derivation Of Matrices for rotation , reflection |
| | 9 | Dr. R. Sahay | II | Fundamental Concepts | Particle in one dimensional box |
| 22.08.2019 | 6 | Pradeep Verma | III | Preparation , structure and bonding | Polyether complexes of alakali metals |
| | 6 | Priyanka Mishra | IV | Elimination reaction | E1CB reaction |
| 24.08.2019 | 7 | Pradeep Verma | III | Preparation , structure and bonding | Polyether complexes of alakali metals |

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| | 7 | Priyanka Mishra | IV | Elimination reaction | E1CB mechanism |
| 26.08.2019 | 8 | Pradeep Verma | III | Preparation , structure and bonding | Polyether complexes of alakaline metals |
| | | Priyanka Mishra | ME | | |
| 27.08.2019 | 10 | Sanjay Jaiswal | I | Molecular Symmetry | Derivation Of Matrices for rotation-reflection, inversion operation |
| | 10 | Dr. R. Sahay | II | Fundamental Concepts | Particle in one dimensional box |
| 28.08.2019 | 11 | Sanjay Jaiswal | I | Molecular Symmetry | Symmetry point group applied to all type of molecules Cnh , Dnh ,Cnv |
| | 11 | Dr. R. Sahay | II | Fundamental Concepts | Particle in one dimensional box |
| 29.08.2019 | 12 | Sanjay Jaiswal | I | Molecular Symmetry | Symmetry point group applied to all type of molecules Td, Oh, and Ih |
| | 12 | Dr. R. Sahay | II | Quantum Mechanical treatment | One dimensional harmonic oscillator |
| 30.08.2019 | 9 | Pradeep Verma | III | Preparation , structure and bonding | Polyether complexes of alakaline metals |
| | 8 | Dr. S. K. Vernwal | IV | Substitution reaction | Mechanism of Nitration and Sulphonation |
| 02.09.2019 | 10 | Pradeep Verma | III | Elimination reaction | Stereochemistry of E2 reaction, factor affecting E1, E2 and E1CB |
| | 9 | Priyanka Mishra | IV | Elimination reaction | E1CB mechanism |
| 03.09.2019 | 11 | Pradeep Verma | III | Preparation , structure and bonding | Polyphosphazene |
| | | Priyanka Mishra | CT | | |
| 04.09.2019 | 13 | Sanjay Jaiswal | I | Molecular Symmetry | Symmetry point group applied to all type of molecules Td, Oh, and Ih |
| | 13 | Dr. R. Sahay | II | Quantum Mechanical treatment | Classical quantum |
| 05.09.2019 | 14 | Sanjay Jaiswal | I | Molecular Symmetry | Symmetry point group applied to all type of molecules Td, Oh, and Ih |
| | 14 | Dr. R. Sahay | II | Quantum Mechanical treatment | Energy level of harmonic and anharmonic oscillator |
| 06.09.2019 | 15 | Sanjay Jaiswal | I | Molecular Symmetry | Group multiplication basis , Matrices representation character of an operation |
| | 15 | Dr. R. Sahay | II | Quantum Mechanical treatment | Rigid rotor model of a diatomic molecules |
| 07.09.2019 | 12 | Pradeep Verma | III | Preparation , structure and bonding | Polyphosphazene |
| | 10 | Dr. S. K. Vernwal | IV | Substitution reaction | Mechanism of halogenation, Friedal crafts reaction |
| 09.09.2019 | 13 | Pradeep Verma | III | Preparation , structure and bonding | Thiazyl and its polymers |
| | 11 | Dr. S. K. Vernwal | IV | Substitution reaction | Orientation |
| 11.09.2019 | 14 | Pradeep Verma | III | Preparation , structure and bonding | $S_4N_2$ |
| | | Dr. S. K. Vernwal | CT | | |
| 13.09.2019 | 16 | Sanjay Jaiswal | I | Molecular Symmetry | Orthogonality , Character table |
| | 16 | Dr. R. Sahay | II | Quantum Mechanical treatment | Energy level of a rigid rotor |
| 14.09.2019 | 17 | Sanjay Jaiswal | I | Molecular Symmetry | Character tables |
| | 17 | Dr. R. Sahay | II | Quantum Mechanical treatment | Rigid rotor , Selection rule |
| 16.09.2019 | 18 | Sanjay Jaiswal | I | Molecular Symmetry | Reducible representation and Irreducible representation |
| | 18 | Dr. R. Sahay | II | Quantum Mechanical treatment | A non rigid rotor |
| 17.09.2019 | 15 | Pradeep Verma | III | Preparation , structure and bonding | Bonding in borane anaion |
| | 12 | Priyanka Mishra | IV | Elimination reaction | E2CB and E2 reaction |
| 19.09.2019 | 16 | Pradeep Verma | III | Structure and bonding of borane anions | Structure of borane anions |
| | 13 | Dr. S. K. Vernwal | IV | Substitution reaction | Orientation |

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| 20.09.2019 | | Pradeep Verma | CT | | |
| | 14 | Dr. S. K. Vernwal | IV | Substitution reaction | Ortho-paira ratio |
| 21.09.2019 | 19 | Sanjay Jaiswal | I | Molecular Symmetry | Reducible representation and Irreducible representation |
| | 19 | Dr. R. Sahay | II | Schrodinger equation for H- atom | Transformation of coordinates |
| 23.09.2019 | 20 | Sanjay Jaiswal | I | Molecular Symmetry | Groups , subgroup and classes |
| | 20 | Dr. R. Sahay | II | Schrodinger equation for H- atom | Separation of Variables |
| 24.09.2019 | 21 | Sanjay Jaiswal | I | Molecular Symmetry | Groups , subgroup and classes |
| | 21 | Dr. R. Sahay | II | Schrodinger equation for H- atom | Separation of Variables |
| 25.09.2019 | 17 | Pradeep Verma | III | Structure and bonding of borane anions | Structure of borane anions |
| | 15 | Dr. S. K. Vernwal | IV | Substitution reaction | Aromatic nucleophilic substitution(ArSN) |
| 26.09.2019 | 18 | Pradeep Verma | III | Classification of structure of silicates | Silicates |
| | 16 | Dr. S. K. Vernwal | IV | Monthly Evaluation | Aromatic nucleophilic substitution(ArSN) |
| 27.09.2019 | 19 | Pradeep Verma | III | Classification of structure of silicates | Classification of silicates |
| | | Priyanka Mishra | ME | | |
| 30.09.2019 | 22 | Sanjay Jaiswal | I | Molecular Vibrations | Symmetry of normal vibration |
| | 22 | Dr. R. Sahay | II | Schrodinger equation for H- atom | Separation of Variables |
| 01.10.2019 | 23 | Sanjay Jaiswal | I | Molecular Vibrations | Determination of normal mode by Internal and Cartesian coordinade methods |
| | 23 | Dr. R. Sahay | II | Schrodinger equation for H- atom | Separation of Variables |
| 03.10.2019 | 24 | Sanjay Jaiswal | I | Molecular Vibrations | Determination of normal mode by Internal and Cartesian coordinade methods |
| | 24 | Dr. R. Sahay | II | Schrodinger equation for H- atom | Separation of R , THEETA, FAI |
| 04.10.2019 | 20 | Pradeep Verma | III | Classification of structure of silicates | Structure of silicates |
| | 17 | Dr. S. K. Vernwal | IV | Substitution reaction | Comparison between Substitution and Elimination reaction Addition –elimination and elimination –addition mechanism |
| 05.10.2019 | 21 | Pradeep Verma | III | Classification of structure of silicates | 3D silicates |
| | 18 | Priyanka Mishra | IV | Elimination reaction | Mechanism and stereochemistry of SN2 reaction |
| 12.10.2019 | | Pradeep Verma | CT | | |
| | 19 | Dr. S. K. Vernwal | IV | Substitution reaction | Mechanism and stereochemistry of SN1 reactions |
| 14.10.2019 | 25 | Sanjay Jaiswal | I | Molecular Vibrations | Determination of normal mode by Internal and Cartesian coordinade methods |
| | 25 | Dr. R. Sahay | II | Schrodinger equation for H- atom | Separation of R , THEETA, FAI |
| 15.10.2019 | 26 | Sanjay Jaiswal | I | Molecular Vibrations | Mixing of Internal coordinate in normal mode |
| | 26 | Dr. R. Sahay | II | Schrodinger equation for H- atom | Spherical harmonics, electron spin |
| 16.10.2019 | 27 | Sanjay Jaiswal | I | Molecular Vibrations | Mixing of Internal coordinate in normal mode |
| | 27 | Dr. R. Sahay | II | Many electron atoms | Anti symmetry |
| 17.10.2019 | 22 | Pradeep Verma | III | Synthesis and structure of | Polyions of Sn |
| | 20 | Dr. S. K. Vernwal | IV | Substitution reaction | Mechanism and stereochemistry of SN2 reactions |
| 18.10.2019 | 23 | Pradeep Verma | III | Synthesis and structure of | Polyions of Pb |

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| | 21 | Priyanka Mishra | IV | Addition reaction | Mechanism and stereochemistry of addition of halogen |
| 21.10.2019 | 24 | Pradeep Verma | III | Synthesis and structure of | Polyions of Sb |
| | | Dr. S. K. Vernwal | ME | | |
| 22.10.2019 | 28 | Sanjay Jaiswal | I | Molecular Vibrations | Mixing of Internal coordinate in normal mode |
| | 28 | Dr. R. Sahay | II | Many electron atoms | Many electron atoms |
| 23.10.2019 | 29 | Sanjay Jaiswal | I | Molecular Vibrations | Selection rule for IR and Raman spectroscopy |
| | 29 | Dr. R. Sahay | II | Many electron atoms | Anti symmetry and slater determination |
| 30.10.2019 | 30 | Sanjay Jaiswal | I | Molecular Vibrations | Normal coordinate analysis of water molecules and its IR and Raman activity |
| | 29 | Dr. R. Sahay | II | Many electron atoms | Slater determination for the wave function |
| 31.10.2019 | 25 | Pradeep Verma | III | Synthesis and structure of | Polyions of Mg |
| | 22 | Priyanka Mishra | IV | Addition reaction | Addition of halogen acids |
| 01.11.2019 | 26 | Pradeep Verma | III | Synthesis and structure of | Polyions of Mg, Definition and classification of oragnometallic compounds |
| | 23 | Dr. S. K. Vernwal | IV | Substitution reaction | Nucleophilic substitution of bridge head carbon atom |
| 04.11.2019 | | Pradeep Verma | CT | | |
| | 24 | Priyanka Mishra | IV | Addition reaction | Addition of halogen acids |
| 05.11.2019 | 31 | Sanjay Jaiswal | I | Molecular Vibrations | Normal coordinate analysis of water molecules and its IR and Raman activity |
| | 30 | Dr. R. Sahay | II | Many electron atoms | Wave function of ground state of multi electron atoms |
| 06.11.2019 | 32 | Sanjay Jaiswal | I | Molecular Vibrations | Normal coordinate analysis of water molecules and its IR and Raman activity |
| | 31 | Dr. R. Sahay | II | Many electron atoms | Wave function of ground state of multi electron atoms |
| 07.11.2019 | 33 | Sanjay Jaiswal | I | Molecular Vibrations | Normal coordinate analysis of Ammonia molecules and its IR and Raman activity |
| | 32 | Dr. R. Sahay | II | Many electron atoms | Self constant , Approximation (Hartree's theory) |
| 09.11.2019 | 27 | Pradeep Verma | III | Organometallic Compounds | Organometallic compounds metal carbonyls bond |
| | 25 | Priyanka Mishra | IV | Addition reaction | 1,2 –Hydroxilation , epoxidation |
| 11.11.2019 | 28 | Pradeep Verma | III | Organometallic Compounds | Organometallic compounds metal carbonyls bond |
| | 26 | Dr. S. K. Vernwal | IV | Substitution reaction | Neighbouring group participation (NGP) |
| 13.11.2019 | 29 | Pradeep Verma | III | Alkyl and aryls | Organolithium compounds |
| | | Priyanka Mishra | CT | | |
| 14.11.2019 | 34 | Sanjay Jaiswal | I | Molecular Vibrations | Normal coordinate analysis of Ammonia molecules and its IR and Raman activity |
| | 33 | Dr. R. Sahay | II | Many electron atoms | Self constant , Approximation (Hartree's theory) |
| 15.11.2019 | 35 | Sanjay Jaiswal | I | Molecular Vibrations | Normal coordinate analysis of Ammonia molecules and its IR and Raman activity |
| | 34 | Dr. R. Sahay | II | Many electron atoms | Self constant , Approximation (Hartree's theory) |
| 16.11.2019 | 36 | Sanjay Jaiswal | I | Molecular Vibrations | Normal coordinate analysis of Ammonia molecules and its IR and Raman activity |
| | 35 | Dr. R. Sahay | II | Aproximation methods | Variation method |
| 18.11.2019 | 30 | Pradeep Verma | III | Alkyl and aryls | Organoberilium compound |
| | 27 | Priyanka Mishra | IV | Addition reaction | Hydroboration of alkene |
| 19.11.2019 | 31 | Pradeep Verma | III | Alkyl and aryls | Organo -aluminium compounds, Organo- tin compounds |

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| | 28 | Priyanka Mishra | IV | Addition reaction | Mechanism of addition of Grignard reagent |
| 20.11.2019 | | Pradeep Verma | CT | | |
| | 29 | Priyanka Mishra | IV | Addition reaction | Organo -Zn and organo- Li saturated and unsaturated compound |
| 21.11.2019 | 37 | Sanjay Jaiswal | I | Molecular Vibrations | Normal coordinate analysis of Ammonia molecules and its IR and Raman activity |
| | 36 | Dr. R. Sahay | II | Aproximation methods | Variation method |
| 22.11.2019 | 38 | Sanjay Jaiswal | I | Molecular Vibrations | Numerical problems |
| | 37 | Dr. R. Sahay | II | Aproximation methods | Variation method |
| 23.11.2019 | 39 | Sanjay Jaiswal | I | Molecular Vibrations | Numerical problems |
| | 38 | Dr. R. Sahay | II | Aproximation methods | Problems & Solutions |
| 25.11.2019 | 32 | Pradeep Verma | III | Alkyl and aryls | Organo- tin compounds |
| | 30 | Priyanka Mishra | IV | Addition reaction | Organo- Li saturated and unsaturated nitriles |
| 26.11.2019 | 33 | Pradeep Verma | III | Alkyl and aryls | Organo- tin compounds |
| | 31 | Priyanka Mishra | IV | Addition reaction | Cannizzaro reaction, Claisen reaction and Knoevenagel |
| 27.11.2019 | 34 | Pradeep Verma | III | Alkyl and aryls | Problems & Solutions |
| | | Priyanka Mishra | ME | | |
| 28.11.2019 | 40 | Sanjay Jaiswal | I | Molecular Vibrations | Numerical problems |
| | 39 | Dr. R. Sahay | II | Aproximation methods | Numerical problems |
| 29.11.2019 | 41 | Sanjay Jaiswal | I | Molecular Vibrations | Numerical problems |
| | 40 | Dr. R. Sahay | II | Problems & Solutions | |
| 30.11.2019 | 41 | Sanjay Jaiswal | I | Molecular Vibrations | Numerical problems |
| | 41 | Dr. R. Sahay | II | Aproximation methods | Problems & Solutions |
| Extra* | 32 | Dr. S. K. Vernwal | IV | Substitution reaction | Participation of sigma bond as NGP |
| * | 33 | Dr. S. K. Vernwal | IV | Substitution reaction | Participation of pi bond and phenyl ring as NGP |
| * | 34 | Dr. S. K. Vernwal | IV | Basic principles of Organic reaction mechanism | Potential energy diagram , Transition state and Intermediate |
| * | 35 | Dr. S. K. Vernwal | IV | Basic principles of Organic reaction mechanism | Method of determination of organic reaction mechanism |
| * | 36 | Dr. S. K. Vernwal | IV | Basic principles of Organic reaction mechanism | Method of determination of organic reaction mechanism |
| * | 37 | Dr. S. K. Vernwal | IV | Basic principles of Organic reaction mechanism | Kinetic isotope effect and its importance |
| | | | | | |