

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

| कक्षा : एम.एस-सी. प्रथम |           | पाठ्यक्रम योजना : सत्र 2018-19 |            | विषय : रसायनशास्त्र                                |                                                                    |
|-------------------------|-----------|--------------------------------|------------|----------------------------------------------------|--------------------------------------------------------------------|
| दिनांक                  | व्याख्यान | प्राध्यापक का नाम              | प्रश्नपत्र | अध्याय                                             | शीर्षक                                                             |
| 16/08/2018              | 1         | Sanjay Jaiswal                 | I          | Molecular Symmetry                                 | Symmetry Elements                                                  |
| 16/08/2018              | 1         | Dr. Ram Sahay                  | II         | Fundamental Concepts                               | Introduction, Operators                                            |
| 17/08/2018              | 2         | Sanjay Jaiswal                 | I          | Molecular Symmetry                                 | Symmetry Elements                                                  |
| 17/08/2018              | 1         | Pradeep Verma                  | III        | Stereochemistry of bonding in main group component | $\sigma$ - $\pi$ bonds                                             |
| 18/08/2018              | 1         | Priyanka Mishra                | IV         | Elimination reaction                               | E1 reactions                                                       |
| 18/08/2018              | 2         | Dr. Ram Sahay                  | II         | Fundamental Concepts                               | Algebra of Operators , Commutator, Linear and Vector operators     |
| 20/08/2018              | CT        | Dr. S. K. Vernwal              |            |                                                    |                                                                    |
| 20/08/2018              | 2         | Pradeep Verma                  | III        | Stereochemistry of bonding in main group component | Bents rule                                                         |
| 21/08/2018              | 2         | Priyanka Mishra                | IV         | Elimination reaction                               | E1 mechanism                                                       |
| 21/08/2018              | 3         | Pradeep Verma                  | III        | Stereochemistry of bonding in main group component | Energetics of Hybridisation                                        |
| 23/08/2018              | 3         | Sanjay Jaiswal                 | I          | Molecular Symmetry                                 | Symmetry operation                                                 |
| 23/08/2018              | 3         | Dr. Ram Sahay                  | II         | Fundamental Concepts                               | Laplacian and Hermition operators                                  |
| 24/08/2018              | 4         | Sanjay Jaiswal                 | I          | Molecular Symmetry                                 | Symmetry operation with special reference to water molecules       |
| 24/08/2018              | 4         | Pradeep Verma                  | III        | Stereochemistry of bonding in main group component | Energetics of Hybridisation                                        |
| 25/08/2018              | 3         | Priyanka Mishra                | IV         | Elimination reaction                               | E2 reactions                                                       |
| 25/08/2018              | 4         | Dr. Ram Sahay                  | II         | Fundamental Concepts                               | Laplacian operators                                                |
| 27/08/2018              | 4         | Dr. S. K. Vernwal              | IV         | Substitution reaction                              | General view, Arenium ion mechanism(ArSE)                          |
| 27/08/2018              | 5         | Pradeep Verma                  | III        | Stereochemistry of bonding in main group component | Polyether complexes of alakali metals                              |
| 28/08/2018              | ME        | Priyanka Mishra                |            |                                                    |                                                                    |
| 28/08/2018              | 6         | Pradeep Verma                  | III        | Preparation , structure and bonding                | Polyether complexes of alakali metals                              |
| 29/08/2018              | 5         | Sanjay Jaiswal                 | I          | Molecular Symmetry                                 | Symmetry operation with special reference to ethane molecules      |
| 29/08/2018              | 5         | Dr. Ram Sahay                  | II         | Fundamental Concepts                               | Concept of normalisation and orthogonality                         |
| 30/08/2018              | 6         | Sanjay Jaiswal                 | I          | Molecular Symmetry                                 | Classification Of Molecules / Ion Based On Their Symmetry Property |
| 30/08/2018              | 6         | Dr. Ram Sahay                  | II         | Fundamental Concepts                               | Postulate of quantum mechanics                                     |
| 01/09/2018              | 5         | Priyanka Mishra                | IV         | Elimination reaction                               | E2 mechanism                                                       |
| 01/09/2018              | 7         | Dr. Ram Sahay                  | II         | Fundamental Concepts                               | Schrodinger wave equation                                          |
| 04/09/2018              | 6         | Priyanka Mishra                | IV         | Elimination reaction                               | E1CB reaction                                                      |
| 04/09/2018              | 7         | Pradeep Verma                  | III        | Preparation , structure and bonding                | Polyether complexes of alkali metals                               |
| 5/09/2018               | 7         | Sanjay Jaiswal                 | I          | Molecular Symmetry                                 | Classification Of Molecules / Ion Based On Their Symmetry Property |
| 05/09/2018              | 8         | Dr. Ram Sahay                  | II         | Fundamental Concepts                               | Particle in one dimensional box                                    |
| 06/09/2018              | 8         | Sanjay Jaiswal                 | I          | Molecular Symmetry                                 | Classification Of Molecules / Ion Based On Their Symmetry Property |
| 06/09/2018              | CT        | Dr. Ram Sahay                  |            |                                                    |                                                                    |

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| 07/09/2018              | 9         | Sanjay Jaiswal                 | I          | Molecular Symmetry                     | Derivation Of Matrices for rotation , reflection                     |
| 07/09/2018              | 8         | Pradeep Verma                  | III        | Preparation , structure and bonding    | Polyether complexes of alkaline metals                               |
| 08/09/2018              | 7         | Priyanka Mishra                | IV         | Elimination reaction                   | E1CB mechanism                                                       |
| 08/09/2018              | 9         | Dr. Ram Sahay                  | II         | Fundamental Concepts                   | Particle in one dimensional box                                      |
| 10/09/2018              | 8         | Dr. S. K. Vernwal              | IV         | Substitution reaction                  | Mechanism of Nitration and Sulphonation                              |
| 10/09/2018              | 9         | Pradeep Verma                  | III        | Preparation , structure and bonding    | Polyether complexes of alkaline metals                               |
| 11/09/2018              | 9         | Priyanka Mishra                | IV         | Elimination reaction                   | E1CB mechanism                                                       |
| 11/09/2018              | 10        | Pradeep Verma                  | III        | Preparation , structure and bonding    | Polyphosphazene                                                      |
| 12/09/2018              | 10        | Sanjay Jaiswal                 | I          | Molecular Symmetry                     | Derivation Of Matrices for rotation-reflection, inversion operation  |
| 12/09/2018              | 10        | Dr. Ram Sahay                  | II         | Fundamental Concepts                   | Particle in one dimensional box                                      |
| 13/09/2018              | CT        | Sanjay Jaiswal                 |            |                                        |                                                                      |
| 13/09/2018              | 11        | Dr. Ram Sahay                  | II         | Quantum Mechanical treatment           | One dimensional harmonic oscillator                                  |
| 14/09/2018              | 11        | Sanjay Jaiswal                 | I          | Molecular Symmetry                     | Symmetry point group applied to all type of molecules Cnh , Dnh ,Cnv |
| 14/09/2018              | 11        | Pradeep Verma                  | III        | Preparation , structure and bonding    | Polyphosphazene                                                      |
| 15/09/2018              | 10        | Priyanka Mishra                | IV         | Elimination reaction                   | Stereochemistry of E2 reaction, factor affecting E1, E2 and E1CB     |
| 15/09/2018              | 12        | Dr. Ram Sahay                  | II         | Quantum Mechanical treatment           | Classical quantum                                                    |
| 17/09/2018              | 11        | Dr. S. K. Vernwal              | IV         | Substitution reaction                  | Mechanism of halogenation, Friedal crafts reaction                   |
| 17/09/2018              | 12        | Pradeep Verma                  | III        | Preparation , structure and bonding    | Thiazyl and its polymers                                             |
| 18/09/2018              | 12        | Dr. S. K. Vernwal              | IV         | Substitution reaction                  | Orientation                                                          |
| 18/09/2018              | 13        | Pradeep Verma                  | III        | Preparation , structure and bonding    | S <sub>4</sub> N <sub>2</sub>                                        |
| 19/09/2018              | 12        | Sanjay Jaiswal                 | I          | Molecular Symmetry                     | Symmetry point group applied to all type of molecules Td, Oh, and Ih |
| 19/09/2018              | 13        | Dr. Ram Sahay                  | II         | Quantum Mechanical treatment           | Energy level of harmonic and anharmonic oscillator                   |
| 20/09/2018              | 13        | Sanjay Jaiswal                 | I          | Molecular Symmetry                     | Symmetry point group applied to all type of molecules Td, Oh, and Ih |
| 20/09/2018              | CT        | Dr. Ram Sahay                  |            |                                        |                                                                      |
| 22/09/2018              | 13        | Priyanka Mishra                | IV         | Elimination reaction                   | E2CB and E2 reaction                                                 |
| 22/09/2018              | 14        | Dr. Ram Sahay                  | II         | Quantum Mechanical treatment           | Rigid rotor model of a diatomic molecules                            |
| 24/09/2018              | 14        | Dr. S. K. Vernwal              | IV         | Substitution reaction                  |                                                                      |
| 24/09/2018              | 14        | Pradeep Verma                  | III        | Preparation , structure and bonding    | Bonding in borane anions                                             |
| 25/09/2018              | 15        | Dr. S. K. Vernwal              | IV         | Substitution reaction                  | Ortho-para ratio                                                     |
| 25/09/2018              | 15        | Pradeep Verma                  | III        | Structure and bonding of borane anions | Structure of borane anions                                           |
| 26/09/2018              | 14        | Sanjay Jaiswal                 | I          | Molecular Symmetry                     | Symmetry point group applied to all type of molecules Td, Oh, and Ih |

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| 26/09/2018              | 15        | Dr. Ram Sahay                  | II         | Quantum Mechanical treatment             | Energy level of a rigid rotor                                                  |
| 27/09/2018              | 15        | Sanjay Jaiswal                 | I          | Molecular Symmetry                       | Group multiplication basis , Matrices representation character of an operation |
| 27/09/2018              | 16        | Dr. Ram Sahay                  | II         | Quantum Mechanical treatment             | Rigid rotor , Selection rule                                                   |
| 28/09/2018              | ME        | Sanjay Jaiswal                 |            |                                          |                                                                                |
| 28/09/2018              | 16        | Pradeep Verma                  | III        | Structure and bonding of borane anions   | Structure of borane anions                                                     |
| 01/10/2018              | 16        | Dr. S. K. Vernwal              | IV         | Substitution reaction                    | Aromatic nucleophilic substitution(ArSN)                                       |
| 01/10/2018              | 17        | Pradeep Verma                  | III        | Classification of structure of silicates | Silicates                                                                      |
| 03/10/2018              | 16        | Sanjay Jaiswal                 | I          | Molecular Symmetry                       | Orthogonality , Character table                                                |
| 03/10/2018              | 17        | Dr. Ram Sahay                  | II         | Quantum Mechanical treatment             | A non rigid rotor                                                              |
| 04/10/2018              | 17        | Sanjay Jaiswal                 | I          | Molecular Symmetry                       | Character tables                                                               |
| 04/10/2018              | 18        | Dr. Ram Sahay                  | II         | Schrodinger equation for H- atom         | Transformation of coordinates                                                  |
| 05/10/2018              | 18        | Sanjay Jaiswal                 | I          | Molecular Symmetry                       | Reducible representation and Irreducible representation                        |
| 05/10/2018              | 18        | Pradeep Verma                  | III        | Classification of structure of silicates | Classification of silicates                                                    |
| 06/10/2018              | 17        | Priyanka Mishra                | IV         | Elimination reaction                     | Comparison between Substitution and Elimination reaction                       |
| 06/10/2018              | 19        | Dr. Ram Sahay                  | II         | Schrodinger equation for H- atom         | Separation of Variables                                                        |
| 09/10/2018              | 18        | Dr. S. K. Vernwal              | IV         | Substitution reaction                    | Addition – elimination and elimination –addition mechanism                     |
| 09/10/2018              | CT        | Pradeep Verma                  |            |                                          |                                                                                |
| 10/10/2018              | 19        | Sanjay Jaiswal                 | I          | Molecular Symmetry                       | Reducible representation and Irreducible representation                        |
| 10/10/2018              | 20        | Dr. Ram Sahay                  | II         | Schrodinger equation for H- atom         | Separation of Variables                                                        |
| 11/10/2018              | 20        | Sanjay Jaiswal                 | I          | Molecular Symmetry                       | Groups , subgroup and classes                                                  |
| 11/10/2018              | 21        | Dr. Ram Sahay                  | II         | Schrodinger equation for H- atom         | Separation of Variables                                                        |
| 12/10/2018              | 21        | Sanjay Jaiswal                 | I          | Molecular Symmetry                       | Groups , subgroup and classes                                                  |
| 12/10/2018              | 19        | Pradeep Verma                  | III        | Classification of structure of silicates | Structure of silicates                                                         |
| 13/10/2018              | 19        | Priyanka Mishra                | IV         | Elimination reaction                     | Mechanism and stereochemistry of SN2 reaction                                  |
| 13/10/2018              | 22        | Dr. Ram Sahay                  | II         | Schrodinger equation for H- atom         | Separation of Variables                                                        |
| 15/10/2018              | 20        | Dr. S. K. Vernwal              | IV         | Substitution reaction                    | Mechanism and stereochemistry of SN1 reactions                                 |
| 15/10/2018              | 20        | Pradeep Verma                  | III        | Classification of structure of silicates | 3D silicates                                                                   |
| 16/10/2018              | CT        | Priyanka Mishra                |            |                                          |                                                                                |
| 16/10/2018              | 21        | Pradeep Verma                  | III        | Synthesis and structure of Polyions      | Polyions of Ge                                                                 |
| 17/10/2018              | 22        | Sanjay Jaiswal                 | I          | Molecular Vibrations                     | Symmetry of normal vibration                                                   |

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| 17/10/2018              | 23        | Dr. Ram Sahay                  | II         | Schrodinger equation for H- atom | Separation of variables R, $\theta$ and $\Phi$                                      |
| 22/10/2018              | 21        | Dr. S. K. Vernwal              | IV         | Substitution reaction            | Mechanism and stereochemistry of SN2 reactions                                      |
| 22/10/2018              | 22        | Pradeep Verma                  | III        | Synthesis and structure of       | Polyions of Sn                                                                      |
| 24/10/2018              | 23        | Sanjay Jaiswal                 | I          | Molecular Vibrations             | Determination of normal mode by Internal and Cartesian coordinate methods           |
| 24/10/2018              | 24        | Dr. Ram Sahay                  | II         | Schrodinger equation for H- atom | Separation of variables R, $\theta$ and $\Phi$                                      |
| 25/10/2018              | 24        | Sanjay Jaiswal                 | I          | Molecular Vibrations             | Determination of normal mode by Internal and Cartesian coordinate methods           |
| 25/10/2018              | 25        | Dr. Ram Sahay                  | II         | Schrodinger equation for H- atom | Spherical harmonics, electron spin                                                  |
| 26/10/2018              | 25        | Sanjay Jaiswal                 | I          | Molecular Vibrations             | Mixing of Internal coordinate in normal mode                                        |
| 26/10/2018              | 23        | Pradeep Verma                  | III        | Synthesis and structure of       | Polyions of Pb                                                                      |
| 27/10/2018              | 22        | Priyanka Mishra                | IV         | Addition reaction                | Mechanism and stereochemistry of addition of halogen                                |
| 27/10/2018              | ME        | Dr. Ram Sahay                  |            |                                  |                                                                                     |
| 29/10/2018              | 23        | Dr. S. K. Vernwal              | IV         | Substitution reaction            | Rate of substrate structure, nucleophile, leaving group and solvents on SN reaction |
| 29/10/2018              | 24        | Pradeep Verma                  | III        | Synthesis and structure of       | Polyions of Sb                                                                      |
| 31/10/2018              | 26        | Sanjay Jaiswal                 | I          | Molecular Vibrations             | Mixing of Internal coordinate in normal mode                                        |
| 31/10/2018              | 26        | Dr. Ram Sahay                  | II         | Many electron atoms              | Anti symmetry                                                                       |
| 01/11/2018              | 27        | Sanjay Jaiswal                 | I          | Molecular Vibrations             | Mixing of Internal coordinate in normal mode                                        |
| 01/11/2018              | 27        | Dr. Ram Sahay                  | II         | Many electron atoms              | Anti symmetry and Slater determination                                              |
| 02/11/2018              | 28        | Sanjay Jaiswal                 | I          | Molecular Vibrations             | Selection rule for IR and Raman spectroscopy                                        |
| 02/11/2018              | 25        | Pradeep Verma                  | III        | Synthesis and structure of       | Polyions of Mg                                                                      |
| 03/11/2018              | 24        | Priyanka Mishra                | IV         | Addition reaction                | Addition of halogen acids                                                           |
| 03/11/2018              | 28        | Dr. Ram Sahay                  | II         | Many electron atoms              | Slater determination for the wave function                                          |
| 12/11/2018              | 25        | Dr. S. K. Vernwal              | IV         | Substitution reaction            | Nucleophilic substitution of bridge head carbon atom                                |
| 12/11/2018              | CT        | Pradeep Verma                  |            |                                  |                                                                                     |
| 13/11/2018              | 26        | Priyanka Mishra                | IV         | Addition reaction                | Addition of halogen acids                                                           |
| 13/11/2018              | 26        | Pradeep Verma                  | III        | Synthesis and structure of       | Polyions of Mg                                                                      |
| 14/11/2018              | 29        | Sanjay Jaiswal                 | I          | Molecular Vibrations             | Normal coordinate analysis of water molecules and its IR and Raman activity         |
| 14/11/2018              | 29        | Dr. Ram Sahay                  | II         | Many electron atoms              | Wave function of ground state of multi electron atoms                               |
| 15/11/2018              | 30        | Sanjay Jaiswal                 | I          | Molecular Vibrations             | Normal coordinate analysis of water molecules and its IR and Raman activity         |
| 15/11/2018              | 30        | Dr. Ram Sahay                  | II         | Many electron atoms              | Wave function of ground state of multi electron atoms                               |

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| 16/11/2018              | 31        | Sanjay Jaiswal                 | I          | Molecular Vibrations     | Normal coordinate analysis of Ammonia molecules and its IR and Raman activity |
| 16/11/2018              | 27        | Pradeep Verma                  | III        | Organometallic Compounds | Definition and classification of organometallic compounds                     |
| 17/11/2018              | 27        | Priyanka Mishra                | IV         | Addition reaction        | 1,2 –Hydroxylation , epoxidation                                              |
| 17/11/2018              | 31        | Dr. Ram Sahay                  | II         | Many electron atoms      | Self constant , Approximation (Hartree's theory)                              |
| 19/11/2018              | 28        | Dr. S. K. Vernwal              | IV         | Substitution reaction    | Neighbouring group participation (NGP)                                        |
| 19/11/2018              | CT        | Pradeep Verma                  |            |                          |                                                                               |
| 20/11/2018              | 29        | Priyanka Mishra                | IV         | Addition reaction        | 1,2 –Hydroxylation , epoxidation                                              |
| 20/11/2018              | 28        | Pradeep Verma                  | III        | Organometallic Compounds | Organometallic compounds metal carbon bond                                    |
| 21/11/2018              | 32        | Sanjay Jaiswal                 | I          | Molecular Vibrations     | Normal coordinate analysis of Ammonia molecules and its IR and Raman activity |
| 21/11/2018              | 32        | Dr. Ram Sahay                  | II         | Many electron atoms      | Self constant , Approximation (Hartree's theory)                              |
| 22/11/2018              | 33        | Sanjay Jaiswal                 | I          | Molecular Vibrations     | Normal coordinate analysis of Ammonia molecules and its IR and Raman activity |
| 22/11/2018              | 33        | Dr. Ram Sahay                  | II         | Approximation methods    | Variation method                                                              |
| 23/11/2018              | 34        | Sanjay Jaiswal                 | I          | Molecular Vibrations     | Normal coordinate analysis of Ammonia molecules and its IR and Raman activity |
| 23/11/2018              | 29        | Pradeep Verma                  | III        | Organometallic Compounds | Organometallic compounds metal carbon bond                                    |
| 24/11/2018              | 30        | Priyanka Mishra                | IV         | Addition reaction        | Hydroboration of alkene                                                       |
| 24/11/2018              | 34        | Dr. Ram Sahay                  | II         | Approximation methods    | Variation method                                                              |
| 26/11/2018              | ME        | Dr. S. K. Vernwal              | IV         | Substitution reaction    | Evidence of NGP , participation of halogen and N atom                         |
| 26/11/2018              | 30        | Pradeep Verma                  | III        | Alkyl and aryls          | Organolithium compounds                                                       |
| 27/11/2018              | 31        | Priyanka Mishra                | IV         | Addition reaction        | Mechanism of addition of Grignard reagent                                     |
| 27/11/2018              | 31        | Pradeep Verma                  | III        | Alkyl and aryls          | Organoberyllium compound                                                      |
| 28/11/2018              | 35        | Sanjay Jaiswal                 | I          | Molecular Vibrations     | Numerical problems                                                            |
| 28/11/2018              | 35        | Dr. Ram Sahay                  | II         | Approximation methods    | Variation method                                                              |
| 29/11/2018              | 36        | Sanjay Jaiswal                 | I          | Molecular Vibrations     | Numerical problems                                                            |
| 29/11/2018              | 36        | Dr. Ram Sahay                  | II         | Approximation methods    | Variation method                                                              |
| 30/11/2018              | 37        | Sanjay Jaiswal                 | I          | Molecular Vibrations     | Numerical problems                                                            |
| Extra*                  | 32        | Pradeep Verma                  | III        | Alkyl and aryls          | Organo aluminium compounds                                                    |
| ”                       | 33        | Pradeep Verma                  | III        | Alkyl and aryls          | Organo tin compounds                                                          |
| ”                       | 32        | Priyanka Mishra                | IV         | Addition reaction        | Organo Zn and Organo- Li saturated and unsaturated compound                   |
| ”                       | 33        | Priyanka Mishra                | IV         | Addition reaction        | Organo- Li saturated and unsaturated nitrites                                 |
| ”                       | 34        | Priyanka Mishra                | IV         | Addition reaction        | Cannizzaro reaction                                                           |

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|---|----|-----------------|----|------------------------------------------------|--------------------------------------------------------------|
| ” | 35 | Priyanka Mishra | IV | Addition reaction                              | Claisen reaction and knoevenagel                             |
| ” | 36 | Priyanka Mishra | IV | Addition reaction                              | Participation of sigma bond as NGP                           |
| ” | 37 | Priyanka Mishra | IV | Addition reaction                              | Participation of pai bond and phenyl ring as NGP             |
| ” | 38 | Priyanka Mishra | IV | Basic principles of Organic reaction mechanism | Potential energy diagram , Transition state and Intermediate |
| ” | 39 | Priyanka Mishra | IV | Basic principles of Organic reaction mechanism | Method of determination of organic reaction mechanism        |
| ” | 40 | Priyanka Mishra | IV | Basic principles of Organic reaction mechanism | Method of determination of organic reaction mechanism        |
| ” | 41 | Priyanka Mishra | IV | Basic principles of Organic reaction mechanism | Kinetic isotope effect and its importance                    |
|   |    |                 |    |                                                |                                                              |
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