

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

| कक्षा : बी.एस.सी. |           | भाग-एक            |            | विषय : रसायनशास्त्र               |                                                                    |
|-------------------|-----------|-------------------|------------|-----------------------------------|--------------------------------------------------------------------|
| दिनांक            | व्याख्यान | प्राध्यापक का नाम | प्रश्नपत्र | अध्याय                            | शीर्षक                                                             |
| 01.08.2013        | 1         | Dr. Shalini Singh | II         | Atomic structure & periodic table | Quantum numbers                                                    |
| 03.08.2013        | 1         | Dr. Ram Sahay     | I          | Gaseous state                     | Postulates of kinetic theory of gases                              |
| 05.08.2013        | 1         | Dr. S.K. Vernwal  | III        | Structure & reactivity            | Hybridisation                                                      |
| 06.08.2013        | 2         | Dr. S.K. Vernwal  | III        | Structure & reactivity            | Homolysis & heterolysis                                            |
| 07.08.2013        | 2         | Dr. Shalini Singh | II         | Atomic structure & periodic table | Shapes of. s, p, d orbitals.                                       |
| 08.08.2012        |           |                   |            | <b>Class Teaching</b>             |                                                                    |
| 10.08.2013        | 2         | Dr. Ram Sahay     | I          | Gaseous state                     | Deviation from ideal behaviour                                     |
| 12.08.2013        | 3         | Dr. S.K. Vernwal  | III        | Structure & reactivity            | Free radicals, carbocations & carbanions                           |
| 13.08.2013        | 4         | Dr. S.K. Vernwal  | III        | Structure & reactivity            | Stability of free radicals, carbocations & carbanions              |
| 14.08.2013        | 3         | Dr. Shalini Singh | II         | Atomic structure & periodic table | Pauli's Exclusion principle, Hund's rule                           |
| 16.08.2013        | 3         | Dr. Ram Sahay     | I          | Gaseous state                     | van der waals equation of state                                    |
| 17.08.2013        |           | Dr. Ram Sahay     |            | <b>Class Teaching</b>             |                                                                    |
| 19.08.2013        | 5         | Dr. S.K. Vernwal  | III        | Structure & reactivity            | Inductive effect                                                   |
| 20.08.2013        | 6         | Dr. S.K. Vernwal  | III        | Structure & reactivity            | Electromeric effect                                                |
| 22.08.2013        | 4         | Dr. Shalini Singh | II         | Atomic structure & periodic table | Aufbau principle, variation of orbital energies with atomic number |
| 23.08.2013        | 4         | Dr. Ram Sahay     | I          | Gaseous state                     | Critical phenomena, $P_3V_3$ isotherms of real gases               |
| 24.08.2013        | 5         | Dr. Ram Sahay     | I          | Gaseous state                     | Continuity of state the isotherms of van der waal equation         |
| 26.08.2013        |           | Dr. S.K. Vernwal  |            | <b>Evaluation</b>                 |                                                                    |
| 27.08.2013        | 7         | Dr. S.K. Vernwal  | III        | Structure & reactivity            | Resonance & hyperconjugation                                       |
| 29.08.2013        | 5         | Dr. Shalini Singh | II         | Atomic structure & periodic table | Energy level diagram                                               |
| 30.08.2013        | 6         | Dr. Ram Sahay     | I          | Gaseous state                     | Relationship between critical constants and van der Waals constant |
| 31.08.2013        | 7         | Dr. Ram Sahay     | I          | Gaseous state                     | The Law of corresponding states reduced equation of state          |
| 02.09.2013        | 8         | Dr. S.K. Vernwal  | III        | Structure & reactivity            | Hydrogen bonding                                                   |
| 03.09.2013        |           | Dr. S.K. Vernwal  | III        | <b>Class Teaching</b>             |                                                                    |

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| 04.09.2013        | 6         | Dr. Shalini Singh | II         | Atomic structure & periodic table | Long form of periodic table based on                                  |
| 05.09.2013        | 7         | Dr. Shalini Singh | II         | Atomic structure & periodic table | electronic configuration                                              |
| 06.09.2013        | 8         | Dr. Ram Sahay     | I          | Gaseous state                     | Root mean square, average velocities                                  |
| 07.09.2013        | 9         | Dr. Ram Sahay     | I          | Gaseous state                     | Most probable velocities                                              |
| 09.09.2013        | 9         | Dr. S.K. Vernwal  | III        | Stereochemistry                   | Chirality, elements of symmetry                                       |
| 10.09.2013        |           | Dr. S.K. Vernwal  |            | <b>Class Teaching</b>             |                                                                       |
| 11.09.2013        | 8         | Dr. Shalini Singh | II         | Periodic properties of elements   | Type of radii-covalent, crystal & vander waal                         |
| 12.09.2013        | 9         | Dr. Shalini Singh | II         | Periodic properties of elements   | Type of radii-covalent, crystal & vanderwaal                          |
| 13.09.2013        | 10        | Dr. Ram Sahay     | I          | Gaseous state                     | Qualitative discussion of Maxwells distribution of molecular velocity |
| 14.09.2013        | 11        | Dr. Ram Sahay     | I          | Gaseous state                     | Collision number, mean free path                                      |
| 16.09.2013        | 10        | Dr. S.K. Vernwal  | III        | Stereochemistry                   | Optical isomerism, of lactic acid & tartaric acid                     |
| 17.09.2013        |           | Dr. S.K. Vernwal  |            | <b>Class Teaching</b>             |                                                                       |
| 20.09.2013        | 12        | Dr. Ram Sahay     | I          | Gaseous state                     | Collision diameter                                                    |
| 21.09.2013        | 13        | Dr. Ram Sahay     | I          | Gaseous state                     | Liquefaction of gases                                                 |
| 23.09.2013        | 11        | Dr. S.K. Vernwal  | III        | Stereochemistry                   | Racemisation & resolution                                             |
| 24.09.2013        | 12        | Dr. S.K. Vernwal  | III        | Stereochemistry                   | D-L & R-S nomenclature                                                |
| 25.09.2013        | 10        | Dr. Shalini Singh | II         | Periodic properties of elements   | Electron affinity and its variation.                                  |
| 26.09.2013        |           | Dr. Shalini Singh |            | <b>Evaluation</b>                 |                                                                       |
| 27.09.2013        | 14        | Dr. Ram Sahay     | I          | Gaseous state                     | Based on Joule Thomson effect                                         |
| 28.09.2013        | 15        | Dr. Ram Sahay     | I          | Liquid state                      | Inter molecular forces                                                |
| 30.09.2013        | 13        | Dr. S.K. Vernwal  | III        | Stereochemistry                   | Geometrical isomerism, E-Z nomenclature                               |
| 01.10.2013        | 14        | Dr. S.K. Vernwal  | III        | Stereochemistry                   | Newmann & Sawhorse projection formula                                 |
| 03.10.2013        | 11        | Dr. Shalini Singh | II         | Periodic properties of elements   | Ionization potential, factors affecting the magnitude of I.P.         |
| 07.10.2013        |           | Dr. S.K. Vernwal  |            | <b>Class Teaching</b>             |                                                                       |
| 08.10.2013        | 15        | Dr. S.K. Vernwal  | III        | Stereochemistry                   | Conformations of ethane & n-butane                                    |

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| 09.10.2013        | 12        | Dr. Shalini Singh | II         | Periodic properties of element               | Concept of effective nuclear charge and shielding effect                           |
| 10.10.2013        | 13        | Dr. Shalini Singh | II         | Periodic properties of                       | Slater's rule                                                                      |
| 11.10.2013        | 16        | Dr. Ram Sahay     | I          | Liquid state                                 | Structure of liquid                                                                |
| 17.10.2013        | 14        | Dr. Shalini Singh | II         | Periodic properties of elements              | Electronegativity                                                                  |
| 19.10.2013        |           | Dr. Ram Sahay     |            | <b>Class Teaching</b>                        |                                                                                    |
| 21.10.2013        | 16        | Dr. S.K. Vernwal  | III        | Carboxylic acids                             | Structure of carboxyl group, acid strength                                         |
| 22.10.2013        | 17        | Dr. S.K. Vernwal  | III        | Carboxylic acids                             | Mechanism of esterification                                                        |
| 23.10.2013        | 15        | Dr. Shalini Singh | II         | Periodic properties                          | Pauling, Muliken & Rochow scale and its variation                                  |
| 24.10.2013        | 16        | Dr. Shalini Singh | II         | Periodic properties                          | Pauling, Muliken & Rochow scale and its variation                                  |
| 25.10.2013        | 17        | Dr. Ram Sahay     | I          | Liquid state                                 | Structural difference between solid, liquid and gases                              |
| 26.10.2013        |           | Dr. Ram Sahay     |            | <b>Evaluation</b>                            |                                                                                    |
| 28.10.2013        | 18        | Dr. S.K. Vernwal  | III        | Carboxylic acids                             | $\text{AC}^{\text{del2}}$ & $\text{B}_{\text{AC}}^2$ mechanism of ester hydrolysis |
| 29.10.2013        | 19        | Dr. S.K. Vernwal  | III        | Carboxylic acids                             | Mechanism of acetylation                                                           |
| 30.11.2013        | 17        | Dr. Shalini Singh | II         | Chemical bonding                             | Ionic-conditions, radius ratio                                                     |
| 06.11.2013        | 18        | Dr. Shalini Singh | II         | Chemical bonding                             | Lattice energy, Born-Haber cycle, polarisation of ions.                            |
| 07.11.2013        | 19        | Dr. Shalini Singh | II         | Chemical bonding                             | Fazan's rule                                                                       |
| 08.11.2013        |           | Dr. Ram Sahay     |            | <b>Class Teaching</b>                        |                                                                                    |
| 09.11.2013        | 18        | Dr. Ram Sahay     | I          | Liquid state                                 | Liquid crystal : difference between liquid crystals                                |
| 11.11.2013        | 20        | Dr. S.K. Vernwal  | III        | Alkenes, alkynes, alkadienes & cycloalkanes  | Addition of hydrogen, halogens & halogen acids                                     |
| 12.11.2013        | 21        | Dr. S.K. Vernwal  | III        | Alkenes, alkynes, alkadienes & cyclo alkanes | Addition of sulphuric acid & water                                                 |
| 15.11.2013        | 19        | Dr. Ram Sahay     | I          | Liquid state                                 | Solid and liquid                                                                   |
| 16.11.2013        | 20        | Dr. Ram Sahay     | I          | Liquid state                                 | Structure of nematic, cholesteric phase                                            |
| 18.11.2013        |           | Dr. S.K. Vernwal  |            | <b>Class Teaching</b>                        |                                                                                    |

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| 19.11.2013        | 22        | Dr. S.K. Vernwal  | III        | Alkenes, alkynes, alkadienes & cyclo alkanes | Hydroboration, epoxidation, ozonolysis & hydroxylation                                                                           |
| 20.11.2013        | 20        | Dr. Shalini Singh | II         | Chemical bonding                             | ..... <sup>2</sup> , Sp <sup>3</sup> , Sp <sup>3</sup> d and Sp <sup>3</sup> d <sup>2</sup>                                      |
| 21.11.2013        | 21        | Dr. Shalini Singh | II         | Chemical bonding                             | Covalent bond, Sp, Sp <sup>2</sup> , Sp <sup>3</sup> , Sp <sup>3</sup> d and Sp <sup>3</sup> d <sup>2</sup>                      |
| 22.11.2013        | 21        | Dr. Ram Sahay     | I          | Solid state                                  | Definition of space lattice, unit cell                                                                                           |
| 23.11.2013        | 22        | Dr. Ram Sahay     | I          | Solid state                                  | Law of crystallography law of constancy of interfacial angles                                                                    |
| 25.11.2013        |           | Dr. S.K. Vernwal  |            | <b>Evaluation</b>                            |                                                                                                                                  |
| 26.11.2013        | 23        | Dr. S.K. Vernwal  | III        | Alkenes, alkynes, alkadienes & cycloalkanes  | Acetylene as carbon acid & addition reactions of acetylene                                                                       |
| 27.11.2013        | 22        | Dr. Shalini Singh | II         | Chemical bonding                             | Determination of shapes of molecules-NH <sub>3</sub> , H <sub>2</sub> O                                                          |
| 28.11.2013        | 23        | Dr. Shalini Singh | II         | Chemical bonding                             | H <sub>3</sub> O <sup>+</sup> , SF <sub>4</sub> , ClF <sub>3</sub> , ICl <sub>2</sub> <sup>-</sup> , I <sub>3</sub> <sup>-</sup> |
| 29.11.2013        | 23        | Dr. Ram Sahay     | I          | Solid state                                  | Law of rationality of indices, law of symmetry, symmetry element in crystals                                                     |
| 30.11.2013        | 24        | Dr. Ram Sahay     | I          | Solid state                                  | X-Ray diffraction by crystal, crystals, derivation of Bragg's equation                                                           |
| 02.12.2013        |           | Dr. S.K. Vernwal  |            | <b>Class Teaching</b>                        |                                                                                                                                  |
| 03.12.2013        | 24        | Dr. S.K. Vernwal  | III        | Alkenes, alkynes, alkadienes & cycloalkanes  | Addition reactions of 1,3-butadiene                                                                                              |
| 06.12.2013        | 25        | Dr. Ram Sahay     | I          | Solid state                                  | Determination of crystal structure of NaCl and KCl                                                                               |
| 07.12.2013        | 26        | Dr. Ram Sahay     | I          | Solid state                                  | A brief introduction to point defects in crystals, semiconductor                                                                 |
| 09.12.2013        | 25        | Dr. S.K. Vernwal  | III        | Alkenes, alkynes, alkadienes & cycloalkanes  | Preparation & properties of small ring cycloalkanes                                                                              |
| 11.12.2013        | 24        | Dr. Shalini Singh | II         | Chemical bonding                             | Max covalency, odd electron bond, hydrogen bond, three electron bond & metallic bond                                             |
| 12.12.2013        |           | Dr. Shalini Singh |            | <b>Class Teaching</b>                        |                                                                                                                                  |
| 13.12.2013        | 27        | Dr. Ram Sahay     | I          | Solid state                                  | Super conductor and nano-particles materials                                                                                     |
| 14.12.2013        | 28        | Dr. Ram Sahay     | I          | Colloidal state & macro molecule             | Definition of colloids, classification of colloids                                                                               |

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| 16.12.2013        | 26        | Dr. Manisha Kapoor | III        | Alkyl halides and Grignard's reagent | Mechanisms of nucleophilic substitution reactions of alkyl halides, preparation of Grignard reagent |
| 17.12.2013        | 27        | Dr. Manish Kapoor  | III        | Alkyl halides and Grignard's reagent | Synthetic applications of Grignard reagent                                                          |
| 18.12.2013        | 25        | Dr. Ram Sahay      | II         | General studies of s-block element   | Discussion on I group elements discussion on II group element                                       |
| 19.12.2013        |           | Dr. Ram Sahay      |            | <b>Class Teaching</b>                |                                                                                                     |
| 20.12.2013        | 29        | Dr. Ram Sahay      | I          | Colloidal state & macro molecules    | Solid In liquid (Sols): properties, kinetic optical and electrical                                  |
| 21.12.2013        | 30        | Dr. Ram Sahay      | I          | Colloidal state & macro molecules    | Stability of colloids, protective action, hardy schuze law, gold number                             |
| 23.12.2013        | 28        | Dr Manisha Kapoor  | III        | Alkyl halides and Grignard's reagent | Synthetic applications of Grignard reagent                                                          |
| 24.12.2013        | 29        | Dr. Manisha Kapoor | III        | Alcohols and ethers                  | Classification and distinctions of primary, secondary and tertiary alcohols                         |
| 26.12.2013        | 26        | Dr. Ram Sahay      | II         | General studies of p-Block elements  | Discussion on 13 <sup>th</sup> group elements<br>Discussion on 14 <sup>th</sup> group element       |
| 27.12.2013        |           | Dr. Ram Sahay      |            | Evaluation molecules                 |                                                                                                     |
| 28.12.2013        | 31        | Dr. Ram Sahay      | I          | Colloidal state & macro molecules    | Liquid in liquid (Emulsion), type of emulsion, preparation, emulsifier                              |
| 30.12.2013        | 30        | Dr. Manisha Kapoor | III        | Alcohols and ethers                  | Mechanism of dehydration of atcohols                                                                |
| 31.12.2013        | 31        | Dr. Manisha Kapoor | III        | Alcohols and ethers                  | Isomerism of propanols, butanols & pentanols                                                        |
| 01.01.2014        | 27        | Dr. Ram Sahay      | II         | General Studies of p-Block element   | Catination and inert pair effect discussion on 15 <sup>th</sup> group element                       |
| 02.01.2014        | 28        | Dr. Ram Sahay      | II         | General studies of p-Block element   | Discussion on 16 <sup>th</sup> Group element trends of their oxides, hydrides & halides             |
| 03.01.2013        |           | Dr. Ram Sahay      |            | <b>Class Teaching</b>                |                                                                                                     |
|                   |           |                    |            |                                      |                                                                                                     |

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| 04.01.2014        | 32        | Dr. Ram Sahay      | I          | Colloidal state & macromolecule            | Liquid in solid (gels), classification preparation and properties inhibition general application of colloids                                        |
| 06.01.2014        | 32        | Dr. Manish Kapoor  | III        | Alcohols and ethers                        | Industrial preparation, reactions and structure of glycerol                                                                                         |
| 07.01.2014        | 33        | Dr. Manisha Kapoor | III        | Alcohols and ethers                        | Ethers: williamson's synthesis, formation and cleavage of oxonium salts                                                                             |
| 08.01.2014        | 29        | Dr. Ram Sahay      | II         | Occurrence, extraction isolation of metals | Ores & metallurgy of Be, metallurgy of $F_2$                                                                                                        |
| 09.01.2014        | 30        | Dr. Ram Sahay      | II         | Chemistry of diborane                      | Preparation, properties & structure of diborane                                                                                                     |
| 10.01.2014        |           | Dr. Ram Sahay      | I          | <b>Class Teaching</b>                      |                                                                                                                                                     |
| 11.01.2014        | 33        | Dr. Ram Sahay      | I          | Colloidal state & macro molecules          | Macromolecules and their molecular weight determination of molecular weight of macro molecule by osmotic pressure & viscosity method                |
| 13.01.2014        | 34        | Dr. Manisha Kapoor | III        | Alcohols and ethers                        | Crown ethers                                                                                                                                        |
| 16.01.2014        | 31        | Dr. Ram Sahay      | II         | Chemistry of borazine                      | Preparation & structure of borazine & hydrazine                                                                                                     |
| 17.01.2014        | 34        | Dr. Ram Sahay      | I          | Colloidal state & macromolecule            | Concept of miscelles and critical miscelles concentration: A brief introduction to conducting and light emitting polymers                           |
| 18.01.2014        | 35        | Dr. Ram Sahay      | I          | Mathematical concept & computer            | Logarithmic relation curve sketching line groups and calculation of slopes                                                                          |
| 20.01.2014        |           | Dr. Manisha Kapoor |            | <b>Class Teaching</b>                      |                                                                                                                                                     |
| 21.01.2014        | 35        | Dr. Manisha Kapoor | III        | General reactions of carbonyl compounds    | Mechanism of addition of alcohol, sodium bisulphite, HCN                                                                                            |
| 23.01.2014        | 32        | Dr. Ram Sahay      | II         | Inter halogen compounds                    | Preparation & properties of inter halogens & polyhalogens                                                                                           |
| 24.01.2014        | 36        | Dr. Ram Sahay      | I          | Mathematical concepts & computer           | Differentiation of functions like $F(x)$ , $e^x$ , $x^h$ , $\sin x$ , $\log x$ , maxima and minima partial differentiation and reciprocity relation |
|                   |           |                    |            |                                            |                                                                                                                                                     |

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| 25.01.2014               | 37        | Dr. Ram Sahay      | I                   | Mathematical concepts & computer        | Integration of some useful/ relevant function permutation and combination, factorial, probability general introduction to computer, different compound of computer. |
| 27.01.2014               | 36        | Dr. Manisha Kapoor | III                 | General reactions of carbonyl compounds | Aldol, cannizzaro reactions                                                                                                                                         |
| 28.01.2014               |           | Dr. Manisha Kapoor |                     | <b>Evaluation</b>                       |                                                                                                                                                                     |
| 29.01.2014               | 33        | Dr. Ram Sahay      | II                  | Xenon fluorides                         | Preparation, properties & structure of Xenon Fluorides                                                                                                              |
| 30.01.2014               | 34        | Dr. Ram Sahay      | II                  | Oxyacids of B                           | Preparation & structure of acids Of –B                                                                                                                              |
| 31.01.2014               | 38        | Dr. Ram Sahay      | I                   | Mathematical concepts & computer        | Hardware and software input-output devices, binary numbers and arithmetics introduction to computer languages                                                       |
| 01.02.2014               | 39        | Dr. Ram Sahay      | I                   | Mathematical concepts & computer        | Programming, operation systems                                                                                                                                      |
| 03.02.2014               | 37        | Dr. Manisha Kapoor | III                 | General reactions of carbonyl compounds | Wolff-Kishner reduction                                                                                                                                             |
| 04.02.2014               | 38        | Dr. Manisha Kapoor | III                 | General reactions Of carbonyl compounds | Catalytic reduction, $\text{LiAlH}_4$                                                                                                                               |
| 05.02.2014               | 35        | Dr. Ram Sahay      | II                  | Oxyacids of P                           | Preparation and structure of P                                                                                                                                      |
| 06.02.2014               | 36        | Dr. Ram Sahay      | II                  | Oxy acids of P                          | Preparation and structure of P                                                                                                                                      |
| 07.02.2014               | 40        | Dr. Ram Sahay      | I                   | Chemical Kinetics & Catalysis           | Chemical kinetics & its scope rate of a reaction factors in fluencing the rate of a reaction, concentration, temperatures, pressure, solvent, light                 |
| 08.02.2014               | 41        | Dr. Ram Sahay      | I                   | Chemical kinetics & catalysis           | Catalyst concentration dependence of rate mathematical characteristics, simple reaction, zero, first, second, pseudo, order, half life and mean life                |

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| 10.02.2014               | 39        | Dr. Manisha Kapoor | III                 | General reactions of carbonyl compounds       | Clemmensen's Meerwein-Ponndorf-Verley reduction                                                                                       |
| 11.02.2014               | 40        | Dr. Manisha Kapoor | III                 | Compounds containing                          | Keto-enol tautomerism, preparation of reactive methylene group acetoacetic ester                                                      |
| 12.02.2014               | 37        | Dr. Ram Sahay      | II                  | Oxy acids of S                                | Preparation and structur of S                                                                                                         |
| 14.02.2014               | 42        | Dr. Ram Sahay      | I                   | Chemical kinetics & catalysis                 | Determination of the order of reaction differential methods, methods For intigration methods of half life period and isolation method |
| 15.02.2014               | 43        | Dr. Ram Sahay      | I                   | Chemical kinetics & catalysis                 | Radioactive decay was a first Order phenomenon, experimental methods for the studying of chemical kinetics                            |
|                          | 41        | Dr. Manish Kapoor  | III                 | Compounds containing reactive methylene group | Synthetic uses of acetoacetic ester                                                                                                   |
|                          | 42        | Dr. Manisha Kapoor | III                 | Compounds containing reactive methylene group | Preparation and synthetic uses of malonic ester                                                                                       |
|                          | 43        | Dr. Manisha Kapoor | III                 | Nitrogen containing compounds                 | Preparation and distinction between alkyl nitrites & nitroalkane                                                                      |
|                          | 44        | Dr. Manisha Kappor | III                 | Nitrogen containing compounds                 | Alkyl cyanides & alkylisocyanides                                                                                                     |
|                          | 45        | Dr. Manisha Kapoor | III                 | Nitrogen containing compounds                 | Amines-classification, distinction                                                                                                    |
|                          | 46        | Dr. Manisha Kapoor | III                 | Nitrogen containing compounds                 | Separation of primary, secondary, & tertiary amines                                                                                   |
|                          | 47        | Dr. Manisha Kapoor | III                 | Nitrogen containing compounds                 | Preparation of amines                                                                                                                 |
|                          | 48        | Dr. Manisha Kapoor | III                 | Nitrogen containing compounds                 | General reactions of amines                                                                                                           |
|                          | 49        | Dr. S.K. Vernwal   | III                 | Numerical questions                           | Numerical questions                                                                                                                   |

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

| कक्षा : बी.एस.सी. |           | भाग-एक            |            | विषय : रसायनशास्त्र           |                                                                                                              |
|-------------------|-----------|-------------------|------------|-------------------------------|--------------------------------------------------------------------------------------------------------------|
| दिनांक            | व्याख्यान | प्राध्यापक का नाम | प्रश्नपत्र | अध्याय                        | शीर्षक                                                                                                       |
|                   | 44        | Dr. Ram Sahay     | I          | Chemical kinetics & catalysis | Effect of temperature on rate of reaction, Arrhenius equation. Concept of activation energy                  |
|                   | 45        | Dr. Ram Sahay     | I          | Chemical kinetics & catalysis | Simple collision theory based on hard Sphere model transition state theory (equilibrium hypothesis)          |
|                   | 46        | Dr. Ram Sahay     | I          | Chemical kinetics & catalysis | Expression for the rate constant on based on equilibrium constant and thermodynamic aspects.                 |
|                   | 47        | Dr. Ram Sahay     | I          | Chemical kinetics & catalysis | Characteristics of catalysed reactions, classification of catalysis, industrial catalyst and enzyme kinetics |
|                   | 48        | Dr. Ram Sahay     | I          | Chemical kinetics & catalysis | Problems and solutions                                                                                       |