

**LESSON PLAN**  
**GOVT.POLYTECHNIC,SONEPUR**

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| Discipline –<br>All Branches | Year-1 <sup>st</sup>          | Name of The Teaching Faculty:-MR. SUBRAT KUMAR MISHRA<br>Guest Faculty in Math                                                            |
| SESSION-<br>2026-27          | No. of<br>days/per<br>week-04 | SUB: MATHEMATICS(TH-1)<br>Commencement of classes from date: 17/08/2026 to 17/04/2027<br>No. of weeks :32 (excluding vacation & Holidays) |
| Week                         | Period                        | TOPICS TO BE COVERED                                                                                                                      |

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| 1 <sup>ST</sup> | 1 <sup>ST</sup> | General introduction, Concept of angles, Measurement of angle in degree, grades, radian                 |
|                 | 2 <sup>ND</sup> | Conversion of degree, grade, radian                                                                     |
|                 | 3 <sup>RD</sup> | Continue , illustrative examples                                                                        |
|                 | 4 <sup>TH</sup> | Introduction to trigonometry and trigonometrical ratios                                                 |
| 2 <sup>ND</sup> | 1 <sup>ST</sup> | ASTC rule and its application                                                                           |
|                 | 2 <sup>ND</sup> | evenfunction, oddfunction, periodic function                                                            |
|                 | 3 <sup>RD</sup> | Problem discussion                                                                                      |
|                 | 4 <sup>TH</sup> | Addition, differences formula of trigonometry and their transformations to products                     |
| 3 <sup>RD</sup> | 1 <sup>ST</sup> | Problem discussion                                                                                      |
|                 | 2 <sup>ND</sup> | Trigonometrical ratios of angle 2A, 3A                                                                  |
|                 | 3 <sup>RD</sup> | Trigonometrical ratios of sub-multiple angle i.e. $A/2$                                                 |
|                 | 4 <sup>TH</sup> | Illustrative examples                                                                                   |
| 4 <sup>TH</sup> | 1 <sup>ST</sup> | Introduction to inverse trigonometric ratios                                                            |
|                 | 2 <sup>ND</sup> | Properties of inverse trigonometric functions                                                           |
|                 | 3 <sup>RD</sup> | Continue                                                                                                |
|                 | 4 <sup>TH</sup> | Problem discussion                                                                                      |
| 5 <sup>TH</sup> | 1 <sup>ST</sup> | Introduction to geometry in two dimensions.                                                             |
|                 | 2 <sup>ND</sup> | Distance formula, division formula and their application                                                |
|                 | 3 <sup>RD</sup> | Area of triangle, area of polygon, problem discussion                                                   |
|                 | 4 <sup>TH</sup> | Slope of a line, angle between two lines, condition for perpendicularity and parallelism                |
| 6 <sup>TH</sup> | 1 <sup>ST</sup> | Straight lines, different form of straight lines, slope-intercept form, one-point form, two-point form. |
|                 | 2 <sup>ND</sup> | Intercept form normal form with illustrative examples                                                   |
|                 | 3 <sup>RD</sup> | Equation of a line passing through a point and i) parallel to a line<br>ii) perpendicular to a line     |
|                 | 4 <sup>TH</sup> | Equation of a line passing through the intersection of two lines, illustrative examples                 |
| 7 <sup>TH</sup> | 1 <sup>ST</sup> | Distance of a point from a line, perpendicular distance between two parallel lines with examples        |
|                 | 2 <sup>ND</sup> | Problem discussion with doubt clearing                                                                  |
|                 | 3 <sup>RD</sup> | Centre and radius of a Circle. General equation of a circle                                             |
|                 | 4 <sup>TH</sup> | Equation of a circle Passing through three given points                                                 |

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| 8 <sup>TH</sup>  | 1 <sup>ST</sup> | Equation of circle when two end points of a diameter are given.                                                        |
|                  | 2 <sup>ND</sup> | Problem discussion                                                                                                     |
|                  | 3 <sup>RD</sup> | Definition of complex number. Real and Imaginary parts of a Complex number.                                            |
|                  | 4 <sup>TH</sup> | Polar and Cartesian representation of a complex number and its conversion from one form to other.                      |
| 9 <sup>TH</sup>  | 1 <sup>ST</sup> | Solving Related problems                                                                                               |
|                  | 2 <sup>ND</sup> | Conjugate of a complex number, Modulus and Amplitude of a complex number                                               |
|                  | 3 <sup>RD</sup> | Addition, Subtraction, Multiplication and Division of a complex number                                                 |
|                  | 4 <sup>TH</sup> | Solving Related problems                                                                                               |
| 10 <sup>TH</sup> | 1 <sup>ST</sup> | Square root of a complex number                                                                                        |
|                  | 2 <sup>ND</sup> | Cube roots of unity.                                                                                                   |
|                  | 3 <sup>RD</sup> | Problems Practices                                                                                                     |
|                  | 4 <sup>TH</sup> | De-moivre's theorem (statement only) and its simple applications.                                                      |
| 11 <sup>TH</sup> | 1 <sup>ST</sup> | Problem discussion with doubt clearing                                                                                 |
|                  | 2 <sup>ND</sup> | Problem discussion                                                                                                     |
|                  | 3 <sup>RD</sup> | Definition of Polynomial, Proper & Improper fractions, Definition of partial fractions                                 |
|                  | 4 <sup>TH</sup> | Resolve proper fraction into partial fractions with denominator containing non-repeated linear factors.                |
| 12 <sup>TH</sup> | 1 <sup>ST</sup> | Resolve proper fraction into partial fractions with denominator containing repeated linear factors.                    |
|                  | 2 <sup>ND</sup> | Resolve proper fraction into partial fractions with denominator containing non-repeated irreducible quadratic factors. |
|                  | 3 <sup>RD</sup> | Factorial of a non-negative integer.                                                                                   |
|                  | 4 <sup>TH</sup> | Determine $P(n, r)$ and $C(n, r)$ .                                                                                    |
| 13 <sup>TH</sup> | 1 <sup>ST</sup> | Binomial theorem (without proof) for positive integral index                                                           |
|                  | 2 <sup>ND</sup> | Determination of general term and Middle term in binomial expansion.                                                   |
|                  | 3 <sup>RD</sup> | Problem discussion with doubt clearing                                                                                 |
|                  | 4 <sup>TH</sup> | Problem discussion                                                                                                     |
| 14 <sup>TH</sup> | 1 <sup>ST</sup> | Introduction to matrices. Order of a matrix                                                                            |
|                  | 2 <sup>ND</sup> | Types of matrices                                                                                                      |
|                  | 3 <sup>RD</sup> | Addition, Subtraction, Scalar multiplication                                                                           |
|                  | 4 <sup>TH</sup> | multiplication of matrices.                                                                                            |
| 15 <sup>TH</sup> | 1 <sup>ST</sup> | Problem discussion                                                                                                     |
|                  | 2 <sup>ND</sup> | Introduction to determinant. Expansion of determinant up to 3rd order                                                  |
|                  | 3 <sup>RD</sup> | Properties of determinants                                                                                             |
|                  | 4 <sup>TH</sup> | Problem discussion                                                                                                     |
| 16 <sup>TH</sup> | 1 <sup>ST</sup> | Minors and Co-factors                                                                                                  |
|                  | 2 <sup>ND</sup> | Inverse of a matrix                                                                                                    |
|                  | 3 <sup>RD</sup> | Problem discussion                                                                                                     |
|                  | 4 <sup>TH</sup> | Solution of system of linear equations by Cramer's rule up to 3 variables.                                             |
| 17 <sup>TH</sup> | 1 <sup>ST</sup> | Problem discussion                                                                                                     |
|                  | 2 <sup>ND</sup> | Solution of system of linear equations by matrix method up to 3 variables                                              |
|                  | 3 <sup>RD</sup> | Problem discussion                                                                                                     |
|                  | 4 <sup>TH</sup> | Problem discussion with doubt clearing                                                                                 |
| 18 <sup>TH</sup> | 1 <sup>ST</sup> | Vector and Scalar Quantities.                                                                                          |
|                  | 2 <sup>ND</sup> | Notation and rectangular resolution of a vector.                                                                       |

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|                  | 3 <sup>RD</sup> | Types of vectors.                                                                      |
|                  | 4 <sup>TH</sup> | Addition, subtraction and scalar multiplication of vectors.                            |
| 19 <sup>TH</sup> | 1 <sup>ST</sup> | Scalar and vector products of two vectors.                                             |
|                  | 2 <sup>ND</sup> | Problem discussion                                                                     |
|                  | 3 <sup>RD</sup> | Angle between two vectors                                                              |
|                  | 4 <sup>TH</sup> | Scalar and Vector projection of a vector on another vector.                            |
| 20 <sup>TH</sup> | 1 <sup>ST</sup> | Area of a triangle and Area of a parallelogram                                         |
|                  | 2 <sup>ND</sup> | Simple problems related to work and moment of a force                                  |
|                  | 3 <sup>RD</sup> | Problem discussion with doubt clearing                                                 |
|                  | 4 <sup>TH</sup> | Problem discussion                                                                     |
| 21 <sup>TH</sup> | 1 <sup>ST</sup> | Definition of function, different types of functions , illustrative examples           |
|                  | 2 <sup>ND</sup> | continue                                                                               |
|                  | 3 <sup>RD</sup> | Introduction to Limit. Limit of a function                                             |
|                  | 4 <sup>TH</sup> | Evaluation of L.H.L.&R.H.L. , Existence of Limit                                       |
| 22 <sup>TH</sup> | 1 <sup>ST</sup> | Methods of Evaluation of Limit ( direct substitution, factorization, rationalization,) |
|                  | 2 <sup>ND</sup> | dividing highest power of x by both Nr. &Dr. Evaluation using standard identities      |
|                  | 3 <sup>RD</sup> | Test of Continuity of a function at a point.                                           |
|                  | 4 <sup>TH</sup> | Problem discussion                                                                     |
| 23 <sup>TH</sup> | 1 <sup>ST</sup> | Differentiation of algebraic functions                                                 |
|                  | 2 <sup>ND</sup> | Differentiation exponential function, logarithmic function,                            |
|                  | 3 <sup>RD</sup> | Differentiation trigonometric and inverse trigonometric functions                      |
|                  | 4 <sup>TH</sup> | Problem discussion                                                                     |
| 24 <sup>TH</sup> | 1 <sup>ST</sup> | Differentiation of sum, product and quotient of functions.                             |
|                  | 2 <sup>ND</sup> | Differentiation of function of a function (Chain Rule).                                |
|                  | 3 <sup>RD</sup> | Differentiation using logarithm.                                                       |
|                  | 4 <sup>TH</sup> | Differentiation of a function w.r.t another function.                                  |
| 25 <sup>TH</sup> | 1 <sup>ST</sup> | Problem discussion with doubt clearing                                                 |
|                  | 2 <sup>ND</sup> | Problem discussion                                                                     |
|                  | 3 <sup>RD</sup> | Integration as inverse process of differentiation.                                     |
|                  | 4 <sup>TH</sup> | Formulae , Illustrative Example                                                        |
| 26 <sup>TH</sup> | 1 <sup>ST</sup> | Simple integration by substitution, Illustrative Example                               |
|                  | 2 <sup>ND</sup> | Problem discussion                                                                     |
|                  | 3 <sup>RD</sup> | Integration by parts, Illustrative Example                                             |
|                  | 4 <sup>TH</sup> | Problem discussion                                                                     |
| 27 <sup>TH</sup> | 1 <sup>ST</sup> | Integration using partial fractions (for linear factors only)                          |
|                  | 2 <sup>ND</sup> | Problem discussion, Illustrative Example                                               |
|                  | 3 <sup>RD</sup> | Problem discussion with doubt clearing                                                 |
|                  | 4 <sup>TH</sup> | Problem discussion                                                                     |
| 28 <sup>TH</sup> | 1 <sup>ST</sup> | Definite integrals of some simple functions                                            |
|                  | 2 <sup>ND</sup> | Properties of definite Integrals (without proof).                                      |
|                  | 3 <sup>RD</sup> | Problem discussion, Illustrative Example                                               |
|                  | 4 <sup>TH</sup> | Problem discussion                                                                     |
| 29 <sup>TH</sup> | 1 <sup>ST</sup> | Simple problem on evaluation of area bounded by a curve and axes.                      |
|                  | 2 <sup>ND</sup> | Continue                                                                               |
|                  | 3 <sup>RD</sup> | Problem discussion with doubt clearing                                                 |

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|                  | 4 <sup>TH</sup> | Problem discussion                                                                          |
| 30 <sup>TH</sup> | 1 <sup>ST</sup> | Introduction to Differential Equation.                                                      |
|                  | 2 <sup>ND</sup> | Order and degree of a differential equation.                                                |
|                  | 3 <sup>RD</sup> | Formation of differential equation.                                                         |
|                  | 4 <sup>TH</sup> | Problem discussion with doubt clearing                                                      |
| 31 <sup>TH</sup> | 1 <sup>ST</sup> | Solution of first order and first-degree differential equation by variable separable method |
|                  | 2 <sup>ND</sup> | Problem discussion                                                                          |
|                  | 3 <sup>RD</sup> | Solution of linear differential equations.                                                  |
|                  | 4 <sup>TH</sup> | Problem discussion with doubt clearing                                                      |
| 32 <sup>TH</sup> | 1 <sup>ST</sup> | Problem discussion                                                                          |
|                  | 2 <sup>ND</sup> | Previous year problem discussion                                                            |
|                  | 3 <sup>RD</sup> | Continue                                                                                    |
|                  | 4 <sup>TH</sup> | Continue                                                                                    |

*Subash*  
14/08/26  
Signature of Faculty

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14.08.2026  
Signature of HOD

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Signature of Academic Co-coordinator