

## SHANTILAL SHAH ENGINEERING COLLEGE, BHAVNAGAR

## GENERAL DEPARTMENT

## MATHEMATICS

- Syllabus of Mid Semester Test- March 2018
- Subject : COMPLEX VARIABLES AND NUMERICAL METHODS(2141905)
- B. E. Semester-IV (Mechanical Branch)

Sr.No.	Topics
1	<p><b>Complex Numbers and Functions:</b>            Exponential, Trigonometric, De Moivre's Theorem, Roots of a complex number ,Hyperbolic functions and their properties, Multi-valued function and its branches: Logarithmic function and Complex Exponent function ,Limit ,Continuity and Differentiability of complex function, Analytic functions, Cauchy-Riemann Equations, Necessary and Sufficient condition for analyticity, Properties of Analytic functions, Laplace Equation, Harmonic Functions, Harmonic Conjugate functions and their Engineering Applications</p>
2	<p><b>Interpolation:</b>            Finite Differences, Forward, Backward and Central operators,            Interpolation by polynomials: Newton's forward ,Backward interpolation formulae, Newton's divided Gauss &amp; Stirling's central difference formulae and Lagrange's interpolation formulae for unequal intervals</p>
3	<p><b>Numerical Integration:</b>            Newton-Cotes formula, Trapezoidal and Simpson's formulae, error formulae, Gaussian quadrature formulae</p>
4	<p><b>Solution of a System of Linear Equations:</b>            Gauss elimination, partial pivoting , Gauss-Jacobi method and Gauss-Seidel method</p>
5	<p><b>Roots of Algebraic and Transcendental Equations :</b>            Bisection, false position, Secant and Newton-Raphson methods, Rate of convergence</p>
6	<p><b>Numerical solution of Ordinary Differential Equations:</b>            Euler and Runge-Kutta methods</p>