

ASSISTANT PROFESSOR (MATHEMATICS)

CGPSC

1. Algebra- Nature and properties of root of an algebraic equation, Differentiation of symmetric function of roots, Transformation, Reciprocal equations, Synthetic division, Repeated roots, Convergence of series of positive terms, Comparison test, Ratio and Root test, Cauchy's Condensation test, Absolute convergence.

.Matrices- Definition of matrix, Multiplication of matrices, Transpose and Inverse of matrix, Adjoint of matrix, Rank of matrix, Solution of Linear equation, Cayley-Hamilton Theorem, Eigen values and Eigen vectors.

2. Trigonometry- Complex numbers and their geometrical representation, De-Moivre's theorem and its applications, Exponential, Logarithmic and Hyperbolic functions, Separation into Real and Imaginary parts.

.Vector Algebra and Vector Calculus- Scalar and Vector product, Triple and Quadruple products of vectors, Differentiation and Integration of vectors, Differential operators, Gradient, Divergence and Curl.

3. Analytic Geometry of two dimensions-The circle including Co-axial and Orthogonal system of circles, Conic sections and their properties (Parabola, Ellipses and Hyperbola) in Cartesian coordinates, Tangent, Normal, Pole, Polar diameter, Conjugate diameters (Ellipse and Hyperbola) and their properties, Director circle, Conjugate Hyperbola and Rectangular Hyperbola.

.Analytical Geometry of Three Dimensions- Direction cosines, Plane and Straight lines, Shortest distance, Sphere, Conical Reciprocal cone.

4. Differential Calculus-Successive differentiation, Partial differentiation, Exponential, Indeterminate forms, Maxima and Minima, Curvature, Envelopes, Asymptotes, Singular points, Curve tracing, Change of variable (for two variable only)

.Integral Calculus-Methods of integration, Definite Integral, Beta and gamma functions, Multiple Integrals.

.Differential equation-Differential equations of the first order and the first degree, Exact Differential equations, Linear Differential equations with constant coefficients and Homogeneous Linear equations.

5. Abstract Algebra- Theory of sets, Functions, Relations, Equivalence relations, Groups, subgroups, Coset decomposition, Normal

subgroup, Homomorphism and Isomorphism of Groups, Homomorphism and Isomorphism of commutative groups, Cyclic groups, Factor groups, Fundamental theorem of Homomorphism of Groups, Rings, Division rings, Integral Domain, Fields, Ideals, Quotient rings, Maximal and Prime Ideals, Ring of polynomials.

.Mathematical Analysis-Dedekind cuts, Countable and uncountable sets, Metric spaces, Limit points, Open and Closed sets, Compact sets, Bounded and perfect sets, Bolzano-Weierstrass theorem, Continuity and differentiability.

6. Complex Variable-Analytic functions of complex variables, Power series, Circle of convergence, Complex integration, Cauchy's theorem, Taylor's and Laurent's series, Singularities, Zeros and Poles, Cauchy's theorem of Residues, Contour Integration.

.TOPOLOGY-Definition and example of Topological spaces, Relative topology, Continuous mapping and Homomorphism, Limit points, Closed sets, Neighbourhoods and Derived sets, Bases and Sub-bases, Countable space.

VIVEK SAHU

Frida27Dec2019