

Module-1 Differential Calculus-1 0 hours

Differential Calculus-1: Review of elementary differential calculus, Polar curves - angle between the radius vector and tangent, angle between two curves, pedal equation. Curvature and radius of curvature- Cartesian and polar forms; Centre and circle of curvature (All without proof-formulae only) - applications to evolutes and involutes. (RBT Levels: L1 & L2)

Module-2 Differential Calculus-2 0 hours

Differential Calculus-2: Taylor's and Maclaurin's series expansions for one variable (statements only), indeterminate forms - L'Hospital's rule. Partial differentiation; Total derivatives- differentiation of composite functions.

condition.Applications of maxima and minima with illustrative examples.Jacobians-simple problems. (RBT Levels:LI & L2)

Module-3	Integral Calculus	0 hours
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Integral Calculus:Review of elementary integral calculus. Multiple integrals: Evaluation of double and triple integrals. Evaluation of double integrals- change of order of integration and changing into polar co ordinates.Applicationsto find areavolume and centre of gravity Beta and Gamma functions: Definitions, Relation between beta and gamma functions and simple problems. (RBT Levels:LI & L2)

Module-4 Ordinary differential equations (ODE's) of first order 0 hours

Ordinary differential equations (ODE's) of first order: Exact and reducible to exact differential equations. Bernoulli's equation. Applications of ODE's- orthogonal trajectories, Newton's law of cooling and L R circuits. Nonlinear differential equations: Introduction to general and singular solutions ; Solvable for p only; Clairaut's and reducible to Clairaut's equations only. **(RBT Levels: L1, L1 & L3)**

Linear Algebra: Rank of a matrix-echelon form. Solution of system of linear equations-consistency. Gauss-elimination method, Gauss- Jordan method and Approximate solution by Gauss-Seidel method. Eigenvalues and eigenvectors Rayleigh's power method. Diagonalization of a square matrix of order two. **(RBT Levels :L1, L2 & L3)**