TIME PLAN SEM - 5

Topic **ODE-I**	**No. of Classes**	**Remarks**
Formation, order & degree of differential equations, first order & first degree equations	4	Basics
Homogeneous & exact equations, integrating factors, linear & Bernoulli equations	6	Application oriented
First order higher degree equations solvable for x, y, p; Clairaut's forms	6	Singular solutions, tac-locus, nodal locus, cuspidal locus
Higher order linear & nonlinear equations, Wronskian, complementary functions, particular integrals	10	Constant coefficients, method of undetermined coefficients
Method of variation of parameters, simultaneous linear differential equations	5	Problem solving
Higher order equations with variable coefficients reducible to constant coefficients (Euler's eqn.), exactness condition, integrating factors	5	Advanced applications
Topic Group Theory I	No. of Classes	Remarks
Definition & examples of groups (permutation, dihedral, quaternion), elementary properties	6	Foundation
Commutative & non-commutative groups, subgroups, necessary & sufficient conditions	6	Subgroup theory
Normalizer, centralizer, center, product of subgroups	4	Important concepts
Order of an element, order of a group, cyclic groups, classification of subgroups of cyclic groups	4	Core properties
Permutations: cycle notation, even/odd permutations, alternating group	2	Permutation theory
Cosets, Lagrange's theorem, consequences including Fermat's little theorem	2	Applications
Topic Mechanics I	No. of Classes	Remarks
Kinematics: rectilinear and curvilinear motion, velocity & acceleration	4	Basics
Dynamics: Newton's laws, motion under variable forces	5	Problem solving
Work, energy, power, potential & kinetic energy	4	Core concepts
Impulse and momentum, collision of particles	3	Applications
Motion of system of particles, center of mass, motion relative to CM	4	Advanced problems