Time Plan for Basic Algebra

Group A [Marks: 25] [20 Classes]

Topic	No. of Classes	Remarks
Polar representation of complex numbers, nth roots of unity, De Moivre's theorem & applications; Exponential, logarithmic, trigonometric, hyperbolic functions of complex variable	6	
Theory of equations: Relations between roots & coefficients, transformation of equation, Descartes rule of signs, Sturm's theorem	6	
Cubic equation (Cardan's method), Biquadratic equation (Ferrari's method)	4	
Inequalities: AM ≥ GM ≥ HM, Cauchy-Schwartz inequality	4	

Group B [Marks: 25] [20 Classes]

Topic	No. of Classes	Remarks
Relation: equivalence relation, classes, partition, partial & linear order relations	4	
Mapping: composition, set theoretic operations, meaning & properties of $f^{-1}(B)$	4	
Well-ordering property, mathematical induction, equivalence with well-	4	

ordering (statement only)		
Division algorithm, Euclidean algorithm, prime numbers, Euclid's theorem, congruence relation, Fundamental Theorem of Arithmetic	4	
Chinese remainder theorem, arithmetic functions (φ, τ, σ) and properties	4	

Group C [Marks: 25] [20 Classes]

Topic	No. of Classes	Remarks
Systems of linear equations: homogeneous & non-homogeneous, existence & uniqueness, Ax=b, row reduction, echelon forms, rank & invertibility, pivot positions, solution sets	8	
Vectors in R^n: algebraic & geometric properties, vector form of linear system, column picture, solutions as linear combinations, geometry of linear span	6	
Uniqueness of solution, linear independence of vectors, algebraic & geometric characterizations	6	