Government College, Chhachhrauli

Summary of Lesson Plan

Name of Teacher: Dr. Indu Bala **Academic Session :2024-25**

Class : B. Sc. II **Semester : IV** **Subject :Algebra & Number Theory**

Unit	Topic/Chapters to be covered	Duration	Assignment and Tests
1	Symmetric, Skew symmetric, Hermitian and skew Hermitian matrices, Elementary operations on matrices	**11-18 Feb**	
1	Rank of a matrix,Inverse of a matrix, Linear dependence and independence ofrows and columns of matrix, Row rank and column rank of amatrix	**19-25 Feb**	
1	Eigen values, Eigen vectors and characteristic equation of a matrix, Minimal polynomial of a matrix Cayley-Hamiltontheorem and its use in finding the inverse of a matrix, Unitaryand orthogonal matrices.	**26 Feb-8 Mar**	
	HOLI BREAK	**9-16 Mar**	
2	Relations between the roots and coefficients of general polynomial equation in one variable, Solutions of polynomial equations having conditions on roots Common roots andmultiple roots, Transformation of equations	**17-31 Mar**	
2	Nature of the roots of an equation, Descarte's rule of signs.	**1-7 April**	
3	Solutions of cubic equations (Cardon's method), Biquadratic equations and their solutions	**8-14 April**	

3	Divisibility, Greatest common divisor (gcd), Least common multiple	**15-21 April**	
3	Prime numbers, Fundamental theorem ofarithmetic.	**22-30 April**	
4	Linear congruences, Fermat's theorem	**01 -07 May**	
4	Euler's theorem, Wilson's theorem and its converse	**08-14 May**	
4	Chinese Remaindertheorem, Linear Diophantine equations in two variables	**15-21 May**	
	Revision of all Units		

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Summary of Lesson Plan

Name of Teacher: Dr. Indu Bala **Academic Session :2024-25**

Class : B. Sc. II **Semester : IV** **Subject : Analytical Geometry & Vector Calculus**

Unit	Topic/Chapters to be covered	Duration	Assignment and Tests
1	General equation of second degree: Classification of conic sections; centre, asymptotes, axes, eccentricity, foci and directrices of conics	**11-25 Feb**	
1	Tangent at any point to a conic, chord of contact, pole of line to a conic, director circle of a conic. Polar equation of a conic, tangent and normal to a conic, confocal conics.	**26 Feb-8 Mar**	
	HOLI BREAK	**9-16 Mar**	
2	Sphere: General form, Plane section of a sphere. Sphere through a given circle. Intersection of two spheres, tangent plane and line, polar plane and line, orthogonal spheres, radical plane of two spheres and co-axal system of spheres.	**17-31 Mar**	
2	Cone: Equation of a cone, right circular cone, quadric cone, enveloping cone. Tangent plane and condition of tangency.	**1-14 April**	

3	Cylinder: Right circular cylinder and enveloping cylinder.	**8-14 April**	
3	Central Conicoids: Equation of tangent plane. Director sphere. Normal to the conicoids. Polar plane of a point. Enveloping cone of a conicoid	**15-30 April**	
3	Enveloping cylinder of a conicoid, confocal conicoid, reduction of second degree equations.	**22-30 April**	
4	Scalar and Vector product of three vectors, four vectors, reciprocal vectors, vector differentiation and derivative along a curve, directional derivatives; Gradient of a scalar point function, divergence and curl of vector point functions, their geometrical meanings and vector identities	**01 -14 May**	
4	Vector integration: line integral, surface integral and volume integral. Theorem of Gauss, Green, Stoke and problems based on these	**15-31 May**	

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Summary of Lesson Plan

Name of Teacher: Dr. Indu Bala **Academic Session : 2024-25**

Class : B. Sc. III **Semester : VI** **Subject : Real and Complex Analysis**

Unit	Topic/Chapters to be covered	Duration	Assignment and Tests
1	Jacobians, Beta and Gama functions	**01 - 07 Jan**	
1	Double and Triple integrals, Dirichlets integrals	**08 - 14 Jan**	
1	change of order of integration in double integrals	**15 - 21 Jan**	
2	Fourier's series: Fourier expansion of piecewise monotonic functions	**22-28 Jan**	
2	Properties of Fourier Co-efficients, Dirichlet's conditions	**29 Jan-4 Feb**	
2	Parseval's identity for Fourier series, Fourier series for even and odd functions	**5-11 Feb**	
2	Half range series, Change of Intervals	**12-18 Feb**	
3	Extended Complex Plane, Stereographic projection of complex numbers	**19-25 Feb**	

3	continuity and differentiability of complex functions Analytic functions	**26 Feb-8 Mar**	
3	**HOLI Break**	**9-16 Mar**	
4	Cauchy-Riemann equations. Harmonic functions, Mappings by elementary functions: Translation	**17-31 Mar**	
4	Rotation, Magnification and Inversion	**1-7 April**	
4	Conformal Mappings, Mobius transformations	**8-14 April**	
4	Fixed pints, Cross ratio, Inverse Points and critical mappings.	**15-21 April**	
	Revision of all Units	**22-30 April**	