



Indraprastha College for Women

University of Delhi

Course Name:	B.A(Program)
Paper Title:	Theory of Equations and Symmetries
Unique Paper Code:	2352202002
Semester:	III
Faculty(s):	Dolly Jain
Year:	2024

Work Plan			
Period	Unit No.	Learning Objective	Topics to be Covered
1 st Aug -3 rd Aug	I	Understand the concept of Polynomials and methods for finding their roots	General properties of polynomials and equations.
5 th Aug-10 th Aug			Fundamental theorem of algebra and its consequences. Consequences of Fundamental theorem of Algebra. Theorems on imaginary and integral roots.
12 th Aug-17 th Aug			Theorems on rational roots. Descartes' rule of signs for positive and negative roots
19 th Aug-24 th Aug		Solving the polynomial Equations with the help of relation between roots and coefficients	Relations between the roots and coefficients of equations. Applications to solution of equations when an additional relation among the roots is given. Applications to solution of equations when an additional relation among the roots is given
26 th Aug-31 st Aug		Concept of De Moivre's theorem	De Moivre's theorem for integral indices. De Moivre's theorem for rational indices.
2 nd Sep-7 th Sep		Application of De Moivre's theorem	the nth roots of unity. symmetries of the solutions
9 th Sep-14 th Sep		II	Solving Cubic and Biquadratic (Quartic) Equations
16 th Sep-21 st Sep	Removal of terms; Cardon's method of solving cubic equations		
23 rd Sep-28 th Sep	Descartes' method of solving biquadratic equations.		
30 th Sep-5 th Oct	III	Understand the concept of symmetric functions	Elementary symmetric functions and symmetric functions of the roots of an equation
7 th Oct-12 th Oct			Newton's theorem on sums of the like powers of the roots;

14 th Oct-19 th Oct			Computation of symmetric functions of polynomial equations
21 st Oct-26 th Oct			Transformation of equations by symmetric functions and in general.
28 th Oct-2 nd Nov			MID SEMESTER BREAK
4 th Nov-9 th Nov		To memorize the previous concepts	Revision
11 th Nov-16 th Nov			Revision
18 th Nov-23 rd Nov			Revision
25 th Nov-27 th Nov			Revision
28 th Nov		DISBERSAL OF CLASSES	

Unit	TOPICS
I	Polynomial Equations and Properties General properties of polynomials and equations; Fundamental theorem of algebra and its consequences; Theorems on imaginary, integral and rational roots; Descartes' rule of signs for positive and negative roots; Relations between the roots and coefficients of equations, Applications to solution of equations when an additional relation among the roots is given; De Moivre's theorem for rational indices, the nth roots of unity and symmetries of the solutions.
2	Cubic and Biquadratic (Quartic) Equations Transformation of equations (multiplication, reciprocal, increase/diminish in the roots by a given quantity), Removal of terms; Cardon's method of solving cubic and Descartes' method of solving biquadratic equations.
3	Symmetric Functions Elementary symmetric functions and symmetric functions of the roots of an equation; Newton's theorem on sums of the like powers of the roots; Computation of symmetric functions such as polynomial equations; Transformation of equations by symmetric functions and in general.
S. No.	Name of Authors/Books/Publishers
1.	Burnside, W.S., & Panton, A.W. (1979). The Theory of Equations (11th ed.). Vol. 1. Dover Publications, Inc. (4th Indian reprint. S. Chand & Co. New Delhi).
2.	Dickson, Leonard Eugene (2009). First Course in the Theory of Equations. John Wiley & Sons, Inc. The Project Gutenberg eBook: http://www.gutenberg.org/ebooks/29785