

**BOARD OF INTERMEDIATE EDUCATION**  
**Syllabus in Mathematics Paper - IIA**  
 To be effective from the academic year 2013-14

Name of Topic and Sub Topics	No. of Periods	5. Pe
<b>ALGEBRA</b>		
<b>01. Complex Numbers</b>		
1.1 Complex number as an ordered pair of real numbers- fundamental operations	03	5.1
1.2 Representation of complex number in the form $a + ib$	03	5.
1.3 Modulus and amplitude of complex number -Illustrations	03	5.
1.4 Geometrical and Polar Representation of a complex number in Argand plane- Argand diagram	04	5.
	13	5
<b>02. De Moivre's Theorem</b>		
2.1 De Moivre's theorem- Integral and Rational indices	05	06. F
2.2 $n^{\text{th}}$ roots of unity- Geometrical Interpretations - Illustrations	05	6
	10	6
<b>03. Quadratic Expressions</b>		
3.1 Quadratic expressions, equations in one variable	02	
3.2 Sign of quadratic expressions - Change in signs - Maximum and minimum values	04	07.
3.3 Quadratic inequations	02	
	08	
<b>04. Theory of Equations</b>		
4.1 The relation between the roots and coefficients in an equation	04	
4.2 Solving the equations when two or more roots of it are connected by certain relation	06	

	4.3 Equation with real coefficients, occurrence of complex roots in conjugate pairs and its consequences	05
	4.4 Transformation of equations - Reciprocal Equations	06
		21
Periods	<b>05. Permutations and Combinations</b>	
	5.1 Fundamental Principle of counting - linear and circular permutations	03
	5.2 Permutations of 'n' dissimilar things taken 'r' at a time	03
	5.3 Permutations when repetitions allowed	03
	5.4 Circular permutations	04
	5.5 Permutations with constraint repetitions	03
	5.6 Combinations-definitions and certain theorems	07
		23
	<b>06. Binomial Theorem</b>	
	6.1 Binomial theorem for positive integral index	12
	6.2 Binomial theorem for rational Index (without proof)	08
	6.3 Approximations using Binomial theorem	04
		24
	<b>07. Partial Fractions</b>	
	7.1 Partial fractions of $f(x)/g(x)$ when $g(x)$ contains non - repeated linear factors	02
	7.2 Partial fractions of $f(x)/g(x)$ when $g(x)$ contains repeated and / or non-repeated linear factors	03
	7.3 Partial fractions of $f(x)/g(x)$ when $g(x)$ contains irreducible factors	02
		07

## PROBABILITY

### 08. Measures of Dispersion

8.1 Range	01
8.2 Mean deviation	03
8.3 Variance and standard deviation of ungrouped/ grouped data	07
8.4 Coefficient of variation and analysis of frequency distributions with equal means but different variances	04
	15

### 09. Probability

9.1 Random experiments and events	06
9.2 Classical definition of probability, Axiomatic approach and addition theorem of probability	05
9.3 Independent and dependent events conditional probability- multiplication theorem and Baye's theorem	07
	18

### 10. Random Variables and Probability Distributions

10.1 Random Variables	04
10.2 Theoretical discrete distributions - Binomial and Poisson Distributions	07
	11
<b>TOTAL</b>	150

## ADDITIONAL READING MATERIAL

For the benefit of students who want to appear for competitive exams based on COBSE the following topics may be given as Additional Reading Material.

1. Exponential and Logarithmic Series
2. Linear Programming