Subject : Mathematics Class : 11

Unit	Topic / Portion deleted for 2020-2021 academic session
I-Sets and Functions	**1. Sets:** Difference of sets, complement of a set, properties of complement sets. **2. Relations and Functions:** Cartesian product ($R \times R \times R$). Sum, difference, product and quotient of functions. **3. Trigonometric Functions:** General Solution of trigonometric equation of type $\sin\theta = \sin\alpha$, $\cos\theta = \cos\alpha$ and $\tan\theta = \tan\alpha$
II-Algebra	**1. Principle of Mathematical induction (Delete Complete section)** **2. Complex Numbers and Quadratic Equations:** Argand plane and polar representation of complex numbers, Square root of a complex number. **4. Permutations and Combinations:** Derivation of formulae for ${}^{n}Pr$ & ${}^{n}Cr$ **5.Binomial Theorem (Delete Complete section)** **6. Sequence and Series:** Sum to n terms of special series : Σn, Σn^2, Σn^3
III-Coordinate Geometry	**1. Straight Lines:** Shifting of origin. Equation of family of lines passing through the point of intersection of two lines. **2. Conic Sections:** A point, a straight line and a pair of intersecting line as a degenerated case of a conic section
IV-Calculus	NIL
V-Mathematical reasoning	Delete full Chapter
VI-Statistics and Probability	**1. Statistics:** Analysis of frequency distributions with equal means but different variances. **2. Probability:** Axiomatic (Set theoretic) probability, connections with the theories of earlier classes.

MATHEMATICS
Revised COURSE STRUCTURE
CLASS 11 (Theory)

One Paper	**Time : 3 hours**	**Max Marks : 80**
Units	**Titles**	**Weightage**
I	Sets and functions	24 Marks
II	Algebra	26 Marks
III	Coordinate geometry	12 Marks
IV	Calculus	08 Marks
V	Statistic and Probability	10 Marks
	TOTAL	80 Marks

UNIT I: SETS AND FUNCTIONS — 24 Marks

1. Sets

Sets and their representations. Empty set. Finite and Infinite sets. Equal sets. Subsets. Subsets of the set of real numbers especially intervals (with notations). Power set. Universal set. Venn diagrams. Union and intersection of sets.

2. Relations and Functions

Ordered pairs, Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of the reals with itself (upto $R \times R$).

Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special kind of relation from one set to another. Pictorial representation of a function, domain, co-domain and range of a function. Real valued function of the real variable, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum and greatest integer functions with their graphs.

3. Trigonometric Functions

Positive and negative angles. Measuring angles in radians and in degrees and conversion from one measure to another. Definition of trigonometric functions with the help of unit circle. Truth of the identity $\sin^2 x+\cos^2 x=1$, for all x. Signs of trigonometric functions and sketch of their graphs. Expressing $\sin(x\pm y)$ and $\cos(x\pm y)$ in terms of $\sin x$, $\sin y$, $\cos x$ and $\cos y$. Deducing the identities like following:

$\tan(x \mp y) = \frac{tanx \mp tany}{1 \mp tanxtany}$, $\cot(x \mp y) = \frac{cotxcoty \mp 1}{coty \mp cotx}$, $sinx + siny = 2sin\frac{x+y}{2}cos\frac{x-y}{2}$,

$\cos x+\cos y = 2\cos\frac{x+y}{2}cos\frac{x-y}{2}$,

$sinx - siny = 2\,cos\frac{x+y}{2}sin\frac{x-y}{2}$, $cosx - cosy = -2sin\frac{x+y}{2}sin\frac{x-y}{2}$

Identities related to $\sin 2x$, $\cos 2x$, $\tan 2x$, $\sin 3x$, $\cos 3x$ and $\tan 3x$. Proofs and simple applications of sine and cosine formulae.

UNIT II: ALGEBRA 26 Marks

1. Complex Numbers and Quadratic Equations

Need for complex numbers, especially $\sqrt{-1}$ to be motivated by inability to solve every quadratic equation. Brief description of algebraic properties of complex numbers. Statement of Fundamental Theorem of Algebra, solution of quadratic equations in the complex number system.

2. Linear Inequalities

Linear inequalities, Algebraic solutions of linear inequalities in one variable and their representation on the number line. Graphical solution of linear inequalities in two variables. Solution of system of linear inequalities in two variables-graphically.

3. Permutations and Combinations

Fundamental principle of counting. Factorial n. Permutations and combinations : their connections, simple applications.

4. Sequence and Series

Sequence and Series. Arithmetic Progression(A.P.), Arithmetic Mean(A.M.), Geometric Progression(G.P.), general term of a G.P., sum of n terms of a G.P. Arithmetic and geometric series, infinite G.P. and its sum, geometric mean(G.M.). Relation between A.M. and G.M.

UNIT III: COORDINATE GEOMETRY 12 Marks

1. Straight Lines

Brief recall of 2-D from earlier classes, Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axes, point-slope form, slope-intercept form, two-point form, intercepts form and normal form. General equation of a line. Distance of a point from a line.

2. Conic Sections

Sections of a cone: Circles, ellipse, parabola, hyperbola. Standard equations and simple properties of parabola, ellipse and hyperbola. Standard equation of a circle.

3. Introduction to Three-dimensional Geometry

Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points and section formula.

UNIT IV : CALCULUS 08 Marks

Limits and Derivatives

Derivative introduced as rate of change both as that of distance function and geometrically, Intuitive idea of limit. $\lim_{x \to 0} \frac{\log_e(1+x)}{x}$, $\lim_{x \to 0} \frac{e^x-1}{x}$

Definition of derivative, relate it to slope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions.

UNIT VI : STATISTICS AND PROBABILITY 10 Marks

1. Statistics

Measure of dispersion; mean deviation, variance and standard deviation of ungrouped/grouped data.

2. Probability

Random experiments: outcomes, sample spaces (set representation). Events: Occurrence of events, ‘not’, ‘and’ & ‘or’ events, exhaustive events, mutually exclusive events. Probability of an event, probability of ‘not’, ‘and’, & ‘or’ events.

Sample Blue Print : Mathematics - 11

Forms of Question/ Topic	Knowledge				Understanding				Application				HOTS				Evaluation				Total
	Obj	SA I	SA II	LA	Obj	SA I	SA II	LA	Obj	SA I	SA II	LA	Obj	SA I	SA II	LA	Obj	SA I	SA II	LA	
Sets, Relations and Functions	1(1)			6(1)	1(1)									2(1)							10(4)
Trigonometric functions	1(1)			6(1)	1(1)		4(1)							2(1)							14(5)
Complex Number, quadratic and Linear Inequations	1(1)		4(1)		2(2)										4(1)						11(5)
Permutation, Combination, Binomial Theorem and Sequences & Series							4(1)		1(1)			6(1)							4(1)		15(4)
Coordinate geometry	1(1)							6(1)	1(1)										4(1)		12(4)
Calculus	2(2)				1(1)				1(1)		4(1)										8(5)
Statistics and Probability		2(1)			1(1)		4(1)		1(1)	2(1)											10(5)
Sub- Total	6(6)	2(1)	4(1)	12(2)	6(6)		12(3)	6(1)	4(4)	2(1)	4(1)	6(1)		4(2)	4(1)				8(2)		**80(32)**
Total	**24(10)**				**24(10)**				**16(7)**				**8(3)**				**8(2)**				

Note : 1) The figures in the bracket denotes the number of questions.

2) This is only a sample Blue Print. The question setter may develop his/her own Blue Print as per the question design.