

MATHEMATICS FORM ONE

TERM	PERIOD	MONTH	WEEK	LESSON TITLES
F I R S T	1	September	1	1) NUMBERS AND NUMERALS *Egyptian Numerals,*Roman Numerals
			2	*Hindu Arabic Numerals
			3	*Place value of digits in Numbers
			4	2) THE SET OF NATURAL NUMBERS: Correct notation $\mathbb{N}$ and not N.*Arithmetic with natural numbers (Order of operations)
	2	October	5	* Number Bases *Bases digit *Correct notation 134_{five} and not 134_5
			6	3) NUMBER PATTERNS *Dot pattern for Triangular, square and Rectangular Numbers *Odd, Even numbers ND Prime numbers
			7	*Introduction to Rational Numbers, .The notation of and examples. 4) FACTORS: *Factors of Numbers *Prime Factorisation.
			8	*The Notion of Indices and simple basis integral laws intuitively derived. *HCF and LCM.
	3	November	9	*Square roots and cube roots using prime Factorisation
			10	*Test for divisibility
			11	5) THE SET OF INTERGERS: Definition, Notation and examples. *The number line. *Operation using the number line.
			12	*Arithmetic with Integers
S E C O N D	4	December	13	6) FRACTIONS: *Types of Fraction *Equivalent fractions,
			14	*Comparing and Ordering fractions, *Operation using fractions
			15	7) DECIMALS *Conversion to fractions and vice versa *Recurring and non-recurring decimals
			16	*Place values in decimals. *Arithmetic with decimals
	5	January	17	*Standard Form. Expression in standard form and from standard forms *Temperature Types of Temperature measurements
			18	8) ARITHMETIC PROCESSES *Ratios *Proportions
			19	*Percentage fractions to percentage and vice versa, percentage to decimals and vice versa, percentage changes.
			20	9) ELEMENTARY GEOMETRY: *Points and line in a plane. *Collinear points * Points in the same plane (coplanar points)
	6	February	21	*Midpoint of a line segment *Bisector of a line segment *Parallel and perpendicular lines (orthogonal lines)
			22	*Angles *Special angles (acute, right, obtuse, straight and reflex angles. Naming angles.
			23	*Angles on a line *Angles at a point *Transversal and terminologies (vertically opposite, adjacent angles) simple notions of these
			24	*Measuring angles and accepted conventions. * Bisector of an angle
T H I R D	7	March	25	*Triangles Types of triangle, drawing and naming triangles. Angle properties of a triangle
			26	*Quadrilaterals *Types od and angles properties of quadrilaterals
			27	*Areas and perimeters of quadrilaterals
			28	*Areas and perimeters of quadrilaterals continue
	8	April	29	*Circles and circles terminology
			30	*Chord *Secant, Tangent and Arc
			31	10) SOLID FIGURES Cuboid and Cubes. Nets of solid figures
			32	Volume and surface area of cubes
F O U R T H	9	May	33	Volume and surface area of cubes continue
			34	b) Right circular cylinders and cones (properties and terminologies)
			35	Volume and surface area of a right circular cone
			36	Volume and surface area of a right circular cone

MATHEMATICS FORM TWO

TERM	PERIOD	MONTH	WEEK	LESSON TITLE
FIRST	1	September	1	1)The set of Natural and number bases: A Review of form one
			2	2)PERCENTAGES: A Review of Form one work
			3	3)FRACTIONS AND DECIMALS: Revision of form one work *the Arithmetic of Fractions and Decimals, Rational Numbers
			4	*Simple Approximations. Rounding up and rounding down
		October	5	Directed numbers: A review of form one work
			6	4)INTRODUCTION TO LAWS OF INDICES to include negative powers, NUMBER PATTERN: Review of form one work
			7	Square root and cube roots. Limit only to perfect square and perfect cube
			8	5)BASICAL ALGEBRA: define Algebra, concept of a variable coefficients, like and unlike terms (limit to quadratic expressions)
	2	November	9	Define expressions identities and equations, simplifying expressions
			10	LCM and HCF of Algebraic expressions
			11	Factorisation by removal of HCF
			12	Expansion(removal of brackets and expansion of simple binomials)
		December	13	Formulae: Definition, numerical value of algebraic expressions, changing the subject of a formula
			14	Simple inequalities: Intervals and number line presentations
			15	Solving simple inequalities
			16	6)PROFIT AND LOSS:*Cost price, Profit or gain, gain percent *Loss and loss percent
SECOND	3	January	17	Simple interest, compound interest, currency and exchange rate
			18	7)RATIO AND PROPOTIONS: Dividing in given ratio
			19	*Proportions: The notion of direct and inverse proportion
			20	Variations: Direct and inverse variations
		February	21	SET THEORY: Types of sets, subsets, power set
			22	Venn Diagram, cardinal number of sets and power set
			23	9)COORDINATE GEOMETRY: Plotting of points in the Cartesian plane, Distance between two points, midpoints
			24	Gradients of straight line
	4	March	25	10) ELEMETATY GEOMETRY: Angles at a point and on a line
			26	The transversal triangle and angle properties
			27	Pythagoras' theorem, polygons: Types of polygons, sum of angle
			28	Polygon continue,[construction of polygon
		April	29	THE CIRCLE: Area, circumference, Arc length, sector and segment
			30	Symmetry: Point symmetry, line symmetry
			31	11) SCALES AND SIMILARITY
			32	Scales and similarity continue
5	May	33	12) ELEMENTARY STATISTICS Collection of data and presentation of data	
		34	Bar chart, pie chart	
		35	Mode median and mean	
		36	The notion of probability and the probability of an event.	
	6	JUNE	37	GENERAL REVISION

MATHEMATICS Form Three

TERM	PERIOD	MONTH	WEEK	LESSON TITLE
F I R S T	1	<i>September</i>	1	1) INDICES AND LOGARITHMS: *Laws of indices (to include fractional indices) Solving simple index equations
			2	*Laws of logarithms, logarithm as inverse of indices and vice versa, simple logarithmic equations
			3	2) ALGEBRAIC PROCESSES *Simplifying algebraic expressions (binomials) *Numerical values of algebraic expressions
			4	*Factorisation, By removal of HCF, grouping ,differences of 2 squares
		<i>October</i>	5	*Factorisation of quadratic Trinomials
			6	*Solution of simple linear equations (a revision)
			7	Simple quadratic equations
			8	3) Simultaneous Equations: Substitution and Elimination
	2	<i>November</i>	9	Solving simultaneous Equations by graphical method
			10	*Worded problem leading to linear simultaneous Equations
			11	4) TRANSPOSITION OF FORMULAE: Changing the subject of a formula; linear forms, brackets, formula involving powers and roots, quotients
			12	5) VARIATIONS: * Direct proportions (variation)
		<i>December</i>	13	*Indirect or inverse variation,*Graphs and variations
			14	Variation as a sum of parts and joint variation
			15	6) SET THEORY and LOGIC: Review form two work, complements and relative complements of sets
			16	Power sets and cardinality of intersection of sets,*Set language to ordinary language and vice versa
S E C O N D	3	<i>January</i>	17	The Venn diagram and three intersecting sets
			18	Elementary logic: Definition of logic, terminologies in logic, statement, truth value, qualifiers, negation and truth table
			19	Compound statements: Introduction, conjunction, disjunction, logically equivalent
			20	De Morgan's law, Conditionals and bi-conditionals
		<i>February</i>	21	7) RELATION: Cartesian product, relation in a set, Ordered Pairs,*Domain, Co domain, Image, Range *Types of relations
			22	*Properties of relation(reflexivity, Symmetric, antisymmetric transitivity), *Equivalence relation
			23	8) FUNCTIONS AND MAPPING: *Domain and Co domain of functions, *Defining a mapping, Types of mapping
			24	*Range of a function,*Numerical value of a function, *Composite function, *Inverse function
	4	<i>March</i>	25	11) TRIGONOMETRY. Reviewing Pythagoras's Theorem, *Angles (types)*Simple trigonometric ratios (Sine, Cosine and Tangent)
			26	*Simple Trigonometric ratios (Sine, Cosine and Tangent) *The scientific calculator, *Complementary angles
			27	10) VECTORS: Definition, position vector, types of vector
			28	*Simple Vector Geometry.*Magnitude and direction of vector
		<i>April</i>	29	9) MATRICES: *Definition of a Matrix, *Order of a matrix, *Equality of matrices, *Types of Matrices
			30	Transpose, Determinant inverse of a matrix,*Singular Matrices
			31	*Solving simultaneous equation by Matrix method
			32	12) GEOMETRY: *Revision of form two work
T H I R D	5	<i>May</i>	33	*Similarity and congruency
			34	13) MENSURATION: Review plane figure, area and perimeters
			35	Surface area and volume of *A sphere
			36	*Cones, Prism and Pyramids
6	6	<i>May</i>	33	*Similarity and congruency
			34	13) MENSURATION: Review plane figure, area and perimeters
			35	Surface area and volume of *A sphere
			36	*Cones, Prism and Pyramids

MATHEMATICS FORM FOUR

TERM	PERIOD	MONTH	WEEK	LESSON TITLE
FIRST	1	September	1	1)NUMBER: *Set of numbers *Ordinary process of Arithmetic,*Estimation and Approximation (Decimal places, Rounding up and rounding down, significant figures, standard forms)
			2	*Place Value, *Use and applications of direct numbers, fractions
			3	*Absolute, relative, percentage round off and truncation errors
			4	*Profit and loss *Ratios and proportions
	2	October	5	*Simple and compound Interest, Maps and Scale
			6	2)ALDEBRA AND NETWORKS *Reviewing form three work
		November	7	*Expansion and factorisation of algebraic expressions(by removal of HCF and by grouping) *Factorisation of quadratic expressions
			8	*Formulae: Numerical value of formulae, *Changing the subject of a formula. Linear equations (a revision)
			9	*Linear simultaneous and quadratic Equations
			10	Solving quadratic equations by factorisation and completing the square
		December	11	3) POLYNOMIAL: Factor and remainder theorem of polynomials
			12	Polynomials continue, sum and difference of two cubes
SECOND	3		13	*Linear and quadratic inequalities
			14	*Intervals and the number line, Graphical linear and simultaneous inequalities, absolute value inequalities
			15	*Indices (a revision)*LCM &HCF of Numbers *LCM &HCF if Algebraic expressions. A brief review of logarithms
			16	*Variations (a revision)
	January	17	4) SEQUENCES AND SERIES. The Arithmetic progression (AP)	
		18	*The Geometric progression (GP)	
		19	*The GP continues	
		20	5) COORDINATE GEOMETRY. *Cartesian coordinate as ordered pairs. *The straight line, *Midpoint, Gradients, *Length of a line segment	
	4	February	21	Equations of a straight line (various forms)
			22	Quadratic Graphs and related activities
			23	Quadratic Graphs continue
			24	7) TRIGONOMETRY: *The right angle triangle and Pythagoram1s Theorem reviewed. *Trigonometric Ratio and their reciprocals.
March	25	Special angles and respective trigonometric ratios. Simple graphs of trigonometric functions. Simple trigonometric equations		
	26	Solution of triangles *Angles of elevation, angles of depression		
	27	*Bearing in two dimensions		
	28	8) VECTORS: Notions, Vector Geometry. The midpoint theorem		
THIRD	5	April	29	*Position Vectors in I, notation and in column forms. Operation on vectors. *Parallel and perpendicular vectors
			30	9) METRICES AND TRANSFORMATION: Revision of form three matrices
	6	31	Transformation; by matrices and by construction. Isometrics: Translation, reflection and rotation	
		32	Enlargement, shares and stretches. Invariant point and lines. Combination of transformations.	
		33	More of transformation, description of transformation	
		34	GENERAL REVISION	
	35			
	36			

MATHEMATICS Form Five

TERM	PERIOD	MONTH	WEEK	SUBJECT TITLE	CORE KNOWLEDGE
F I R S T	1	September	1	Matrices and Transformation A) MATRICES	Revision of form 3 work. Use of matrices to solve simultaneous equations
			2	B) TRANSFORMATION	Transformation of a point on the Cartesian plane; Transformation of a line and a plane figure; Isometries
			3		Enlargement; shear and stretch; Invariant point and lines; successive transformation; application to real life.
			4	EUCLIDEAN GEOMETRY A) Introduction	Collinear point; coplanar points; parallel line and perpendicular line
		October	5	First sequence	Evaluation and correction of script
			6	B) ANGLES	Properties of angles and transversal
			7	c) TRIANGLES	Triangles in a triangle; interior angle sum; exterior and corresponding opposite interior angles' Pythagoras's theorem
			8	D) POLYGONS	Regular polygons; sum of interior angles of a convex polygon; sum of exterior angles
	2	November	9	E) CONGRUENCY AND SIMILARITY	Congruent plane figure; congruency in triangles, similar plane figure; similar triangles, application of similarity to area and volume
			10	F) SYMMETRY	Point and line symmetry properties of some plane figures.
			11	Second sequence	Evaluation and Correction
			12	LOCI AND CONSTRUCTION A) Loci	Definitions and types; loci of a point at a given distance from i) a fixed point ii) a fixed line
		December	13	B) Geometrical construction	Basic use of drawing instruments; copying of length, line segment and angles; triangles of given dimension; angle bisector; mediator of straight line
			14		Angle bisector; mediator of a straight line; tangent to a circle from given point; circum-circle/ inscribe circle of a triangle
			15	CIRCLE THEOREM	Vocabularies associated with circle; Arc length; area of a sector and area of a segment
			16	Third sequence Evaluation	Evaluation and Correction
S E C O	3	January	17		Chord and Tangent properties of a circle; Angle subtended at the centre of the circumference; cyclic quadrilateral

N D T H I R D			18	STATISTICS AND PROBABILITY A) Statistics	Data collection and display; measures of central tendency; cumulative frequency table; cumulative frequency curve
			19		Measures of dispersion: range; interquartile range; semi interquartile range; semi interquartile range; mean deviation, variance standard deviation
			20	B) Probability	The ideas of probability Probability of an event Laws of probability
		February	21		Compound event; mutually exclusive events; independent events Conditional probability; use of tree diagrams
		March			
		April &	22	Fourth sequence	Evaluation and correction
		May	23 to 36	General revision Preparation for mock Mock Examination General Revision	

SCHEME OF WORK FOR ADDITIONAL MATHEMATICS FORM FOUR

TERM	PERIOD	MONTH	WEEK	SUBJECT TITLE	
F I R S T	1	September	1	1) INDICES: Law of indices and index equation	
			2	2) LOGARITHM: Laws of logarithm, simple logarithmic equation	
			3	The function of the form $a^x \log_e x$, log equation	
			4	3) SURD: Reduction to basic forms, conjugate of surds	
		October	5	Rationalising the denominator	
			6	4)QUADRATIC THEORY: The quadratic function, maximum and minimum value of the QF	
			7	Quadratic equation: Solution of quadratic equation by completing the square	
			8	The Discriminant and Nature of roots of quadratic equations	
	2	November	9	Relationship between roots and coefficients	
			10	Relationship between roots and coefficient continues	
			11	5)absolute value function: Definition and inequalities involving absolute value	
			12	6)POLYNOMIALS: Remainder and facto theorem	
December		13	Polynomial equations of order 3		
		14	7)CARTESIAN COORDINATE GEOMETRY: Distance between two points, coordinate of the midpoint of a line segment		
S E C O N D	3		15	Equation of a straight line	
			16	Parallel and perpendicular lines, intersection of two lines	
			17	Angles between two lines, Distance from a point to line	
			18	8) PERMUTATION AND COMBINATHION: Simple problem involving arrangement and selections.	
		January	19	9)BINOMIAL THEOREM: Expansion of $(a+b)^n$ for positive integral indices; Pascal triangle for $n \leq 10$	
			20	General term nC_r for $n < 0, r > 0$ and ≤ 0	
			February	21	Expansion of $(a+b)^n$ for negative integral indices
				22	10)SEQUENCE AND SERIES: Increasing and decreasing linear functions of a sequence, use of the sigma notation
	23	Arithmetic progression			
	24	Geometric progression			
	4	March	25	11)APPLICATION AND TRANSFORMATION OF THE 2-D PLANE: Application of 2x2 matrices, transformation of matrices	
			26	Transformation associated with 2x2 matrices	
27			Transformation, enlargement, stretch, shares		
28			Reflection, rotation		
April		29	Combination of transformation, invariant properties of rectilinear figures. The invariant point, the invariant line		
		30	12)ELEMAENTARY GROUP THEORY: Binary operations, operations table		
		31	Properties of binary operations		
		32	13)GROUPS: Order of a group, subgroup, abelian groups		
5		33	REVISION. END OF YEAR EXAMINATIONS		
		34			
		35			
		36			
T H I R D	6	May			

ADDITIONAL MATHEMATICS SCHEME FORM FIVE

TERM	PERIOD	MONTH	WEEK	SUBJECT TITLE
FIRST SECOND	1	September	1	1)TRIGONOMETRY: Radiant measure-conversion from degrees to radiant and vice versa; arc length area of sector/segment The three basic trigonometric ratios for angles to 360 ⁰
			2	Solution for triangles: sine and cosine rules. HERO`s formula
			3	Trigonometric ratio for angles and their associates, Angles in a clockwise direction and negative angles, Quadrant, complementary and supplementary angles
			4	Graphs of trigonometric functions and their multiples, sum and periodicity of these function, graphs of composite trigonometric functions
		October	5	Relationship between trigonometric ratio: Identities solution of trigonometric equations
			6	2)LINEAR PROGRESSION: Graphical solution and representation of linear simultaneous equations and inequalities
			7	Objective function, extreme value of a solution of a system of linear inequalities
			8	Maximum and minimum value of a function defined over a solution set, problem requiring the maximum of objective function
	2	November	9	3) DIFFERENTIATION: As a limit, differentiation from first principle.
			10	differentiation of standard function, differentiation `of sum
			11	Differentiation of product, quotient, function of function
			12	Application: gradients, stationary point, tangents and normal elementary.
		December	13	4)INTEGRATION: As a reverse of differentiation of power of except x ⁻¹ , of <i>sin ax</i> and <i>cos ax</i>
			14	The fundamental theorem of calculus, definite integral
			15	Application: Areas under of a curve, area between two curves
3				
SECTION B: MECHANICS				
		January	16	5)APPLICATION OF CALCULU: Solid of revolution, centre of mass of uniform laminas, distribution in two dimensions
			17	Connected rate of change 6)DYNAMICS: Kinematics of a particle in a straight line velocity and acceleration: $a=\frac{ds}{dt} = \frac{d^2s}{dt^2}$; Displacement, velocity and acceleration as vectors
			18	Relative velocity, Newton`s law of motion, momentum and impulse
4			19	7)FORCES: As vectors, moments of a force, friction
			20	8)WORK, ENERGY AND POWER
			21	REVISION
SECTIONC: STATISTICS AND PROBABILITY				
			16	5)DESCRIPTIVE STATISTICS: Collection, classification and tabulation of data, data representation; pie/bar charts
		February	17	Pictogram, Histogram, line graph, frequency distribution, cumulative frequency curve
			18	Good and misleading representations
	5	March	19	6)MEASURES OF CENTRAL TENTENCY: Mean, median, mode
April			20	7)MEASURES OF DISPERSION: Range, interquartile, variance, standard deviation
T		may		

H I R D			21	Simple transformations
			22	8) PROBABILITY : Conditional probability
	6		23	9) ELEMENTARY DISTRIBUTION : Discrete random variation, binomial distribution
			24 TO 36	REVISION
				MOCK AND GENERAL REVISION

LOWER SIXTH PURE MATHEMATICS

TERM	PERIOD	MONTH	WEEK	LESSON TITLE
F I R S T	1	September	1	1) SURD, INDICES & LOGARITHMS (A brief revision of first cycle work) *Indices: Law of indices & solution of exponential equations
			2	*Logarithms: Definition, laws of logarithms & Change of base of a logarithmic equations
			3	2) INEQUALITIES : Revision of quadratic inequalities. Quotient and modulus inequalities
			4	3) THE QUADRATIC THEORY *The quadratic function: Maximum and minimum value of a quadratic function, line of symmetry of quadratic function, *The quadratic Equation, solving by factorisation and by completing the square
	2	October	5	The Discriminant and Nature of roots of a quadratic equation, Relationship between roots and coefficients of a quadratic equation
			6	4) POLYNOMIALS : Factor and 'remainder theorems of polynomials
			7	5) PARTIAL FRACTIONS : The concept of partial fraction.* Linear fraction, *Repeated factors and *Quadratic factor at the denominators.
			8	More on partial Fraction
		November	9	6) PERMUTATION AND COMBINATIONS The concept of permutation review and further elaborated. Conditional permutation
			10	Combination: The concept of combination, combination from different groups, combination followed by permutation, mutually exclusive events
			11	7) SEQUENCE AND SERIES : The Arithmetic and Geometric progression The Arithmetic progression: *the general, last or nth term, *The Arithmetic mean, *Sum of the first n terms of an A.P
			12	The GP: The n term, the geometric mean, *sum of the first n term of a GP. *Convergence and sum to infinity, * The sigma notation
	3	December	13	8) THE BINOMIAL THEOREM : The Pascal's triangle. Binomial expansion of the form $(a+b)^n$ where n is integral or rational
			14	The validity of a binomial expansion. Applications of the binomial theorem for approximation
			15	9) SUMMATION OF FINITE SERIES . By standard result, By method of differences
			16	10) LOGIC AND MATHEMATICAL PROOFS . The basic notion of logic revised and further developed
S E C O N D	4	January	17	Mathematical proofs: The notion of proof in science & types of proofs, proofs by counter examples, proofs by Induction
			18	Proofs by induction continues, proof by contradiction
			19	11) COORDINATE GEOMETRY : Revision of straight line geometry. Distance between two points, gradients of a line segment, equation of a straight line, division of line segment into a given ratio. Internal and external division, line through the point of intersection of two lines
			20	LUCOS : The circle: Standard equation of a circle, Circle terminologies, Orthogonal circles, Touching circles (internal and external touching)
	4	February	21	Intersecting circles, circles through the point of intersecting of two circles. *Parametric equation of a curve
			22	12) THE CONCEPT OF A LINEAR RELATION . Reduction of a relationship to linear form and resulting graphs.
			23	Reduction of aa relationship to linear form continues
			24	13) COMPLEX NUMBERS : The notion of imaginary number as the largest det of numbers, Geometrical representation of a complex number. Realising the denominator of a complex number

T H I R D	5	March	25	Polynomial equations with complex roots. Modulus and arguments of a complex number. Complex numbers in trigonometric, polar o in modulus-argument forms.
			26	DE MOIVRE'S Theorem and the nth root of a complex number
			27	14) NUMERICAL METHOD FOR SOLVING EQUATIONS : Newton-Raphson's method
			28	Linear interpolation, trapezium rule
	6	April	29	15) MATRICES AND DETERMINANTS : Revision of matrices , addition, subtraction and multiplication of matrices
			30	Transpose of matrices and their properties of transposes
			31	Determinants of 2X2 and 3X3 matrices. Application of determinants e.g. Cramer's rule for simultaneous equation, The Gaussian elimination method
			32	Inverse of a 3X3 matrices. Solution of simultaneous equation by matrices method(limited to unknowns), The Gaussian elimination method
		May	33	Transformation using matrices
			34	Transformation continues, combined transformation
			35	Invariant Points and lines
			36	REVISION

UPPER SIXTH PURE MATHEMATICS

TERM	PERIOD	MONTH	WEEK	SUBJECT TITLE
F I R S T	1	September	1	1) SETS AND THEIR REPRESENTATIONS *Types of sets, power sets *De Morgan's law
			2	More on sets
			3	2) BINARY RELATIONS: *The concept of a binary relation in a set *A relation from a set to another. *Ordered pairs
			4	*Properties of relations: Equivalence relations, equivalence classes
		October	5	*Relation of inclusion *Total order relation on a set R
			6	Other relations 3) FUNCTIONS: *The concept of a function as a one-one or many-one mapping from a set R (or subset of R) to R
			7	*The domain and range (or image set) of a functions. *Odd and even function *Composite functions *The inverse of a one-one function
			8	*Graphical and other representation of function. *Graphical illustration of a relationship between a function and its inverse
	2	November	9	*Periodicity of a function. Definition of $f(x+a) = f(x)$ of a periodic function, of a period a . *Types of functions or mapping: Injective, subjective and bijective mapping
			10	4) TRIGONOMETRY: *The use of a circle: Arc length, sectors and segments. *The unit circle and the 6 trigonometric ratios *The sine and cosine formula of a triangle
			11	Trigonometric identities: *The Pythagorean identities *The compound angle identities (addition and product formulae) their use and their applications *Deduction of half angle identities *The factor formulae
			12	*Expression of the form $a\cos\theta \pm b\sin\theta$ in terms of the sine or cosine functions such as $r\cos(\theta \pm \alpha)$ and $r\sin(\theta \pm \alpha)$ where $r > 0$ and α is an acute angle.
		December	13	*General and particular solution of trigonometric equations within given intervals. The knowledge of primary and second values
			14	*The approximations $\sin x \cong x$, $\tan x \cong x$, $\cos x \cong 1 - \frac{1}{2}x^2$ *The inverse of trigonometric functions defined over consistent domain
	3		15	5) CALCULUS (i) Limits: *Uniqueness of limits; *Simple theorem on limits: Limits of sum and quotients (without proofs) *Knowledge of $\lim_{x \rightarrow \infty} \left(1 + \frac{x}{n}\right)^n = e^x$ and $\lim_{n \rightarrow \infty} \left(\frac{x^n}{n!}\right) = 0$ are necessary.
			16	li) DIFFERENTIATION: The notion of derivatives *From first principle. The use of formula. Techniques in differentiation (product, quotients and chain rule)
		January	17	Differentiation of * trigonometric function, *exponential functions, *logarithmic function, *implicit function
			18	Differentiation of * parametric function and inverse trigonometric function Application of differentiation: *Increasing and decreasing functions
			19	*Rate of change, *Tangent and Normal *Turning points and points of inflexion
			20	*Maximum and minimum problems
			21	*Curve sketching
S E C O N D				

T H I R D	4	February	22	iii) INTERGRATION: *As the reverse of differentiation, *Indefinite and definite integrals
			23	Integration, *by recognition, *by substitution, *by partial fractions, *by parts
			24	Integration of trigonometric function: Powers of sine, cosine, tangents, and multiple angle integration
	5	March	25	Application of integration: *Areas
			26	*Volumes of revolution
			27	Centroids and centre of mass, *The trapezium rule
			28	6) DIFFERENTIAL EQUATIONS: Limited to first order first degree variable separable
	6	April	29	11) VECTORS: Revision of vectors in two dimension, The orthogonal vectors i, j, k and the Cartesian components of vector. Equation of straight line in the form r=a + b
			30	Equation of straight line in Cartesian and parametric forms. *Direction ratio and direction cosine of a line
			31	Parallel, intersecting and skew lines, scalar products of two vectors, Angle between two lines
		May	32	Equation of a plane in vector, Cartesian and parametric forms
			33	Equation of a plane continues
			34	Angles between a line and plane, angles between two planes
			35	Intersection of line and a plane
			36	REVISION

MATHEMATICS: MECHANICS FOR UPPER

TERM	PERIOD	MONTH	WEEK	SUBJECT TITLE
F I R S T	1	September	1	1) PROBABILITY: * Terms associated to probability *Probability of an event *Independent and mutually exclusive events
			2	*Sum and product laws of probability *Conditional probability
			3	*Probability tree diagram
			4	2) FORCES: *Types of forces *Resolutions of forces *Equilibrium of forces *Conditions for equilibrium
		October	5	*Reviewing the triangle of forces and Lami's theorem *Rigid Bodies under coplanar forces
			6	*Moment of a force *Applications of basic conditions for equilibrium
			7	Couples
			8	12) CENTRE OF MASS OF UNIFORM RIGID BODIES: *Composite bodies using symmetry
	2	November	9	*By Integration
			10	3) KINEMATICS: *Uniformly accelerated motion (Equations of motion) and solving problems by using graphs
			11	*Motion with variable acceleration: The use of Calculus in analysing motion. The use of the equation $\frac{dv}{dt} = f(v)$ or $\frac{dv}{dt} = f(t)$ also $v \frac{dv}{dx} = f(x)$ or $v \frac{dv}{dx} = f(v)$
			12	4) VELOCITY AND ACCELERATION AS VECTORS. Here lay a lot of emphasis on vector notations Differentiating a vector with respect to a scalar variable
		December	13	Integrating a vector with respect to a scalar variable Relative motion and Closest approach
			14	5) CIRCULAR MOTION: *Forces in circular motion *Equations of circular motion *Relation between circular and linear quantities clearly brought out *Radial and tangential Accelerations
S E C O N D	3		15	*The Conical pendulum
			16	6) PROJECTILE MOTION: *As motion in two dimensions *Range *Time of flight *Maximum height *Velocity and displacement in projectile motion
		January	17	Projectile motion continues: Various position of projection
			18	7) NEWTON'S LAW OF MOTION: *Statement of law (Derivation of $F = ma$) *Friction and the Coefficient of friction
	4	February	19	*The Inclined plane
			20	*Motion of connected particles
			21	10) MOMENTUM AND IMPULSE: *Impulse-Momentum
			22	*Conservation of linear momentum
		March	23	*Direct impact of Elastic bodies and the coefficient of restitution. A knowledge of $0 \leq e \leq 1$ is expected
			24	*Impact with a fixed obstacle
			25	11) WORK, ENERGY and POWER *The work-Energy

T H I R D	5		26	*Hooke’s law and Elastic potential Energy
			27	*Power: The use of P=FV
			28	General Revision of Pure and Applied Mathematics
	6	April	29	General Revision of Pure and Applied Mathematics
			30	General Revision of Pure and Applied Mathematics
			31	General Revision of Pure and Applied Mathematics
			32	General Revision of Pure and Applied Mathematics
		May	33	General Revision of Pure and Applied Mathematics
			34	General Revision of Pure and Applied Mathematics
			35	General Revision of Pure and Applied Mathematics
			36	General Revision of Pure and Applied Mathematics

SCHEME OF WORK
PURE MATHEMATICS WITH STATISTICS

TERM	PERIOD	MONTH	WEEK	LESSON TITLE
F I R S T	1	September	1	ELEMENTARY PROBABILITY: -Introduction -Complementary event
			2	-Conditional probability -Sum and product rules -Mutually exclusive
			3	-Independent events -Probability tree diagram
			4	DISCRETE RANDOM VARIABLES: -The probability mass function of a discrete random variable -The expected value $E(X)$, the mode and the median
		October	5	-The variance, $\text{Var}(X)$ -The cumulative distribution function, $F(X)$ -The uniform distribution
			6	-The binomial distribution -The geometric distribution -The mean of the sum of difference of two discrete random variable
			7	-The variance of the sum of difference of two discrete random variables -The Poisson distribution
			8	-Use of the Poisson distribution as an approximation to the binomial distribution -Relationship between probability distribution and frequency distribution
	2	November	9	CONTINUOUS PROBABILITY DISTRIBUTIONS: -The probability density function $f(x)$ -Use of the (cumulative) distribution function
			10	-Determination of the mean, median, mode or quartiles of a specified continuous function
			11	-Variance of a continuous function -The exponential distribution
			12	The normal distribution (use of tables to find probabilities) -Continuity correction
		December	13	-Use of the normal distribution as an approximation to the binomial -Application of continuity correction
			14	-Use of the normal distribution as an approximation to the Poisson, with application of continuity correction
			15	SAMPLE AND POPULATONS: -Graphical representations of sample data
			16	-Frequency and cumulative frequency polygons for ungrouped and grouped sample data -The mean as a measure of location
S E C O N D	3	January	17	-The median and mode as measure of location -Weighted means
			18	-Variance and standard deviation as measure of dispenseion -Range and interquartile range -Combined mean and combined variance for two or more samples
			19	SAMPLING WITH OR WITHOUT REPLACEMENT FROM A FINITE POPULATION -Sampling distribution of statistics
			20	-Use of random numbers and sampling of attributes
	4	February	21	SAMPLING FROM AN INFINITE POPULATION: -The distribution of sample means from an infinite population
			22	-The central limit theorem for large samples -Determination of confidence limits for the mean

T H I R D			23	HYPOTHESIS TESTING (FOR LARGE SAMPLES ONLY): -The roles of the null and alternative hypotheses
			24	-Significance testing of a hypothetical value for probability and for the means
		March	25	REVISION
	5		26	GENERAL REVISION G.C.E MOCK EXAMINATION
			27	
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			29	
	6	April	30	
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			35	
			36	
		May		

LOWER SIXTH: SCHEME OF WORK FOR FUTHER MATHEMATICS

TERM	PERIOD	MONTH	WEEK	SUBJECT TITLE
F I R S T	1	September	1	1) DIVISION AND EUCIDEAN ALGORITHMS The greatest Common Divisor and the least common multiple of integers Relatively prime numbers and prime numbers Fundamental theorem of Arithmetic, representation of integers in different basis
			2	Linear Diophantine equation of the form $ax + by = c$ Modular Arithmetic, linear congruencies
			3	2) ALGEBRAIC STRUCTURES Concept of a group. Axioms of group $(G, *)$. Abelian groups properties of a group
			4	Cayley tables, Symmetries, permutations. Finite and infinite groups, order of a group, cyclic groups and generators
		October	5	Lagrange's theorem isomorphism between two groups 3) LINEAR TRANSFORMATIONS Finite dimensional vector spaces, definition and properties of linear transformations.
			6	Linear transformation of column vectors in 2 and 3 dimensions. Matrix representation of linear transformation Composite transformation. The inverse when it exists of a linear transformations Image and Kernel of linear transformation
			7	4) MATHEMATICAL REASONING AND PROOFS. Meaning of $p \Leftarrow q, p \Rightarrow q, p \leftrightarrow q$ Propositions, compound propositions truth table, logical equivalence, negation and contra positive
			8	Qualifiers and quantifiers, Mathematical proof Relationship between a theorem and its converse
	2	November	9	5) POLAR COORDINATES Sketching of polar curve. Finding tangents parallel and perpendicular to the initial line
			10	6) FURTHER CONTINUITY OF REAL-VALUED FUNCTIONS Continuity at a point. Points of continuity. Continuity on an interval
			11	The Intermediate value Theorem for continuous functions and applications Sum product and quotient of continuous functions. Continuity of the composite function.
			12	7) FUTHER PRTEL FRACTIONS Partial fractions of the form $\frac{ax+b}{(px+q)(rx^2+t)}$ 8) HYPERBOLIC AND INVERSE HYPERBOLIC FUNCTION Properties of hyperbolic and inverse hyperbolic functions
		December	13	Derivatives and integrals of hyperbolic functions Logarithmic equivalence of inverse hyperbolic functions
			14	9) SEQUENCES AND SERIES Convergent sequences, bounded sequences, monotone sequences Inductive defined sequences generated by a simple relation of the form $X_{n+1}=f(x_n)$ Test for convergence: Divergence of sequences
			15	Use of partial fractions in the summation of series Elementary ideals of convergence of a series. The sum of a series as a limit of a sequence of partial sums. Use of the method of difference
			16	Primary test and secondary test for convergence of series Maclaurin and Taylor series. Taylor polynomials, series and applications in evaluating limits of quotient functions.
S E C O	3	January	17	10) FUTHER CURVE SKETCHING Graphs of curves given in Cartesian and parametric form

N D	4		18	Interpretation of the sign of f(x, y) in the x-y plane. Concavity at a point and points inflexion
			19	11)DIFFERENTIAL EQUATIONS First order differential equations: Origins and geometric interpretations, variable separable First order linear non-homogeneous differential equations of the form $\frac{dy}{dx} + Py = Q$ Where P and Q are functions of x
			20	Homogeneous Equations of the form: $\frac{dy}{dx} = f\left(\frac{y}{x}\right)$ using the substitution y=vx Linear second order differential equation $a\frac{d^2y}{dx^2} + b\frac{dy}{dx} + cy = f(x)$, Where a, b, c are real constants and a particular integral can be found by means of a given substitution
			February	21
	22	12)FURTHER INTERGRESSION Motivation and definition of the definite integral. Integration using simple substitute. Use of partial fractions in integration		
	23	Simple reduction formulae 13)APPLICATION OF THE DEFINITE INTEGRAL Mean value and root mean square value of a function		
	24	Arc length and area of surface of revolution. Theorem of Pappus		
	5	March	25	14)FURTHER COORDINATE GEOMETRY Cartesian and parametric equations of a parabola and an ellipse Properties Tangents and normal
			26	Cartesian and parametric equations of a hyperbola, The rectangular hyperbola Properties Tangents and normal
			27	Simple loci problems
			28	15)FURTHER COMPLEX NUMBERS De Moivre’s theorem and its applications
	6	April	29	Use of the relation $e^{i\theta} = \cos\theta + i \sin \theta$ Modulus o inequalities and applications
			30	Loci in the Argand diagram. Elementary transformation from the z-plane to the w-plane
			31	Transformation of the plane. Geometrical transformations similarity transformation and their complex number representation of the form $zz \mapsto az + b$ or $z \mapsto a\bar{z} + b$ where a and b are complex numbers and a is not zero. Rigid motion
			32	16) THE VECTOR PRODUCT AND ITS APPLICATIONS Revision of vectors. The vector product la x b l and the triple scalar product (a x b).c
		May	33	Application to areas and volumes. Applications to points lines and planes
34			REVISION	
35				
36				END OF YEAR ACTIVITIES

END OF YEAR ACTIVITIES

UPPER SIXTH
FURTHER MATHEMATICS

TERM	PERIOD	MONTH	WEEK	LESSON TITLE
F I R S T	1	September	1	NUMERICAL METHOD Simpsons Rule and its applications Numerical solutions of the first order and second order differential equations by step by step methods
			2	Use of Taylor series method for series solutions for differential equations
			3	APPLICATION OF SCALAR AND VECTOR PRODUCTS Vector components of a vector in a given direction. Work done by a constant force.
			4	Moments of force. Analysis of simple system of forces in three dimensions
		October	5	MOTION OF A PARTICLE IN TWO DIMENSIONS Velocity and acceleration components using Cartesian coordinates
			6	Velocity and acceleration components using polar coordinates
			7	OBLIQUE IMPACT OF ELASTIC BODIES Impact between two smooth spheres
			8	Impact between a smooth sphere and a fixed plane
	2	November	9	MODELLING WITH DIFFRENTIAL EQUATIONS Further setting up and solutions of differential equations from simple situations
			10	Resisted motion of a particle moving in a straight line
			11	SIMPLE AND DAMPED HARMONIC MOTION Simple harmonic motion
			12	Damped harmonic motion
		December	13	PROBABNILITY DISTRIBUTION Discrete random variables. Expectation and variance of discrete random variables
			14	The discrete uniform, binomial geometric distribution
			15	The Poisson distribution
			16	The continuous random variables. Probability density function and the cumulative distribution fiction
S E C O N D	3	January	17	The expectation, variance and mode of a continuous random variable
			18	The normal distribution
			19	Use of the normal distribution as an approximation to the binomial and Poisson distributions
			20	ROTARIONAL DYNAMICS Moments of inertia
		February	21	Moments of inertia continues
			22	Radii of gyration, including use of the parallel axes theorems
			23	Motion of a rigid body under the action of a torque Moment of momentum about a fixed axis
			24	Kinetic energy of rigid body rotating about a fixed smooth axis Compound pendulum
	4	March	25	REVISION AND MOCK EXAMINATION
			26	
			27	
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		April May	29	
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T H I R D	6		33	
			34	
			35	
			36	

