St. Mary's College

Additional Mathematics

Course Outline

Academic year

2023/2024

Form 4

CSEC additional mathematics format of examination from 2021:

Paper 1 (1 hour 30 minutes):

45 multiple choice questions [30%]

Paper 2 (2hours 40 minutes): **Six** compulsory questions [50%]

Section1: Algebra, Sequence and Series

Section II: Coordinate Geometry, Vectors and Trigonometry

Section III: Introductory to Calculus

Section IV: Probability and Statistics

Paper3: SBA component 30 marks [20%]]

Text: Additional mathematics, A complete course for CSEC, author Raymond Toolsie

TERM 1

	Section I	
1.	Quadratics	-Factorizing quadratics -Completing the square -Graph of the quadratic function -Use of the Discriminant -Solve equations reducible to quadratics -applications of the sum and product of the roots -Simultaneous equations: one linear and other non- linear.
2.	Quadratic inequalities	-quadratic inequalities in one unknown

		-Determine solution sets algebraic or graphical method -Determine solution sets for rational inequalities of the form $\frac{ax+b}{cx+d} > 0 \ldots etc$
3.	Surds	-definition of surds, irrational number -simplifying surds -perform operations on surds: addition, subtraction, multiplication, rationalization of denominator
4.	Indices	-Define indices -Use of indices laws -Solve equations with one unknown reducible to linear and quadratic
5.	Logarithms	-relationship between indices and logs -Use of log laws, [exclude change of base] -Use logs to solve equations -Conversion to linear form

Term 2

1.	Algebra Remainder and Factor Theorems	-Identify the degree of a polynomial -perform operations on polynomials : addition, subtraction, multiplication and division -division of polynomial by a linear or quadratic -Application of remainder theorem -Application of factor theorem -Evaluate unknown coefficients -Factorizing a cubic equation
2.	Sequence and Series	-Define sequence -Write the specific term of a sequence from a nth term formulae -Define series, identify and use summation notation $\sum$ -identify an arithmetic and geometric sequence and series -summation of arithmetic and geometric series

		-Sum to infinity.
	Section II	
3.	Coordinate geometry 1	-equation of a straight line -parallel, perpendicular lines, points of intersections.
4.	Coordinate geometry 2	-equation of a circle -determine centre, radius -problems involving equations of tangent and normal to a circle -points of intersection between straight line and circle

Term 3

1.	Vectors	-definition and graphical representation of 2-d vectors - addition and subtraction of vectors -multiplication by a scalar -unit vector -modulus and direction of a vector -scalar or dot product of vectors -angle between two vectors -problem involving parallel and perpendicular vectors
	Section III	
3.	Trigonometry 1	-radians, arcs and sectors -Graph of sine, cosine, tangent
	Section IV	
4.	Statistics 1 Data representation and Analysis	-Qualitative and quantitative data - Determine quartiles and percentiles of raw and grouped data -range, interquartile range , semi interquartile range -stem and leaf diagrams, box and whisker plots -advantages and disadvantages of stem and leaf diagrams and box and whisker plot -calculate mean, mode median, variance and standard deviation of group and ungrouped data - interpret measures of central tendency and dispersion.

5.	SBA discussion	

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Form 5

TERM 1

	Section 3	
1.	Trigonometry 2	-Identities -Compound angle formulae -double angle formulae -Solve simple trigonometric equations including in the application of $sin^2\theta + cos^2\theta = 1$
2.	Differentiation	-Differentiation of simple polynomials, trigonometric functions sine and cosine. -chain rule -product rule -quotient rule -tangents and normal -second differentiation
3.	Applications of differentiation	-real world application -rates of change -stationary points -maximum/ minimum pts -kinematics: velocity and acceleration include graph

4.	Submission SBA drafts	

Term 2

1.	Integration	-anti derivative -integrate sine cosine function -definite and indefinite integrals
2.	Application of Integration	-area of the region bounded the curve and a line parallel to the y –axis in the first quadrant -volume generated about the x-axis Kinematics: displacement, velocity
	Section 4	
3.	Statistics 2 : Probability	-concept of probability - relation with set theory -addition rule -mutually exclusive events -conditional probability
4.	Submission of final SBA	