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Mathematical Academy

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UP TGT SYLLABUS

Mathematics

Commerce/Mathematics : -

Working time and working time, compound interest, banking, taxation, flow of elementary rules illustrated.

Statistics : -

Frequency Button, Graphical Representation of Statistical Data, Measures of Central Tendency, Measures of Dispersion, Birth/Death Statistics, Indices.

Algebra : -

Radixes, polynomials and their factors, logarithms, linear equation of two unknown quantities, greatest common factor and least common factor of a polynomial, simultaneous equation of an exponential with three unknowns, factorization of a quadratic polynomial, quadratic equation, ratio and proportion, number system, set operations mapping

Determinant : -

Definition, determinants and cofactors, expansion of determinants up to order 3×3 , general properties of determinants, solution of system of n linear equations ($n = 3$) with the help of Cramer's rule, types of matrices, sum of matrices up to order 3×3 Product transformation matrix, inverse matrix of symmetric and asymmetric matrix, solution of simultaneous equation of three unknowns with the help of

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matrix, theory of equations, symmetric functions of roots, arithmetical, geometric, series, and series formed from terms of squares and cubes of natural numbers sum of Permutations and combinations, binomial theorem, sum of exponential and logarithmic series.

Probability : -

Principles of addition and multiplication.

Set Theory : -

Laws of Set Algebra, Equivalence, Relations, Mappings, Combination of mappings, Inverse mappings, Applications of Peano's axiom and induction axiom. Partial groups and group homomorphisms, subgroups generated by subsets, cyclic groups, degree of any measure, subgroups of cyclic groups, coset disjunction, Lagrange's theorem.

Real analysis : -

Axioms of real numbers, countability of sets, distance space, adjacency, open set, closed set, derived set, dense set, complete set, Bolzano-Weierstrass theorem and other general theorems.

Sequences of real numbers : -

Limit of sequence, official sequence, divergent sequence, bounded sequence, unitary sequence, operations on convergent sequences, Cauchy sequence, Cauchy's theorem on limits and Cauchy principle on convergence of real sequences, limits and continuous real-valued functions. Left side and right-side limits, continuity of a function, characteristics of continuous functions, discontinuity and its types.

Trigonometry : -

Trigonometric ratios of circular measures and specific angles, sum and difference of two angles, and refracting and refracting angles of an angle, trigonometric integrals, trigonometric equations, solution of a triangle, radius and properties of inner and outer circles, inverses General properties of circular functions.

Complex numbers : -

Their sum and product, De Moivre's theorem and its applications. Height and distance. Exponential functions, circular functions and hypers of complex circles.

Hyperbolic functions : -

Separation into real and imaginary parts.

Geometry : -

Baudhayan Pythagoras principle and its extension Circle and segment of circle, arc and chord of circle, tangent to circle, alternate segment of circle and its angles, segments of chord and rectangle formed from them, symmetry of linear plane figures.

Coordinate geometry : -

Radical plane, line, pair of straight lines represented by general homogeneous equation of second degree, angle between them and equation of pair of bisectors, standard equation and parabola of conic (circle, parabola, ellipse and hyperbola) in right angle tangential coordinates. , Constraints to represent pair of lines, circle, parabola, ellipse and hyperbola by quadratic general equation, obtaining equations of circle, parabola, ellipse and hyperbola with the help of transfer of origin and axes Intersection with a conic, condition of its being tangent in limit condition, parametric equation of tangents, pair of tangents from external point to

conic, equation of normal to touch or be instant at any point of conic, condition of conicity in polar coordinates (biquadratic) Equations, three dimensional geometry of sphere, cone and cylinder.

Calculus : -

Differentiation : -

Definition of differentiation, Algebraic trigonometry, Differentiation of exponential and logarithmic functions, Tangent and normal, Tracing of maxima and minima of simple curves of a function of one variable,

Integration : -

Integration by parts and substitution, Integration with the help of partial fractions, Definite integration and its use in determining the area, cylinder, conic sphere under planar curves and the differential surface of the equation. The order and degree of the differential equation. Solving the equations in the following way in the examples of linear motion under gravity-

(i) $\frac{dy}{dx} = f(x)$

(ii) $\frac{dy}{dx} = f(x, y)$

(iii) $\frac{d^2y}{dx^2} = f(x)$

Vector analysis : -

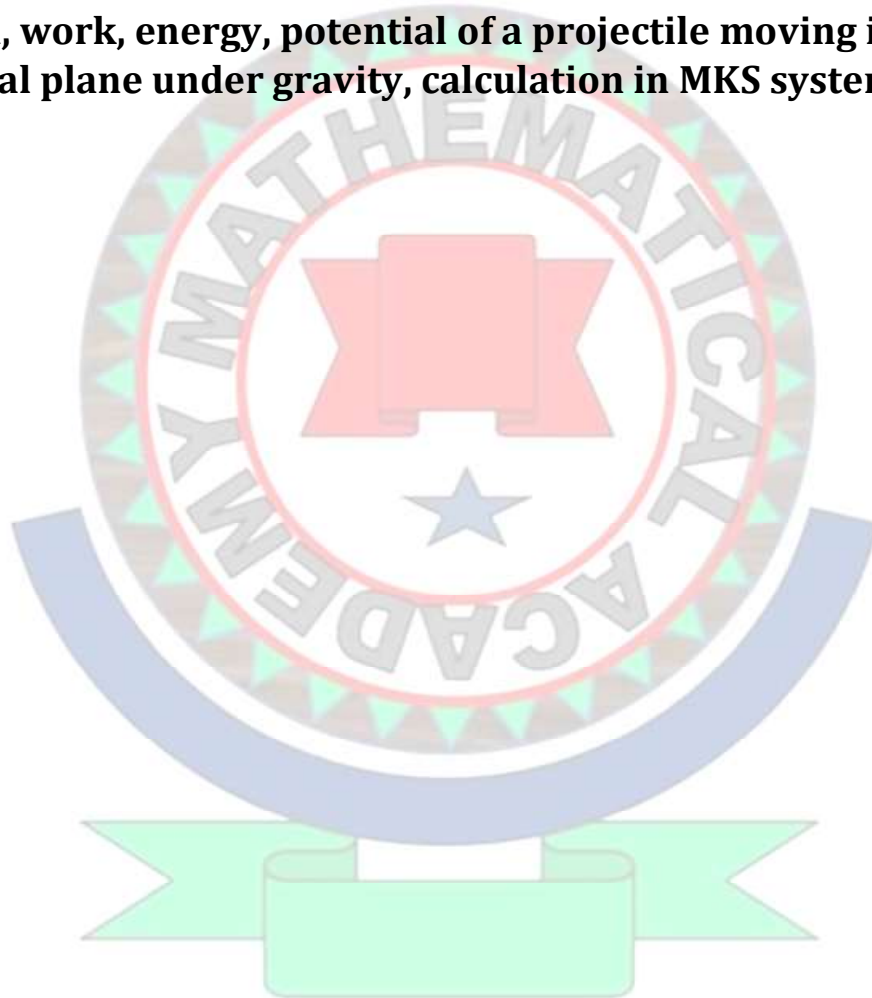
Vectors in the form of ordered pair and ordered triplet, displacement vector, free vector, unit vector, modulus and cosine, equal vector, sum of vectors (force, velocity, acceleration), combination of two vectors, inter-relative velocity of two vectors Calculation of scalar and vector multiplication functions, their use in the calculation of torque and torque, triplication of vectors.

Statics : -

Equilibrium of bodies acting on three forces, Lami's theorem, triangle law, trigonometric theorem and general conditions of planning equilibrium in two right-angled forces. Centre of gravity.

Kinetics : -

Speed, work, energy, potential of a projectile moving in a vertical plane under gravity, calculation in MKS system.



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