

Major Paper I – ALGEBRA AND CALCULUS

Unit I

Binomial, exponential and logarithmic series (proof not needed) – finding the coefficient of x^n in the expansions summation and approximation problems.
Theory of Numbers: Prima and composite numbers – Decomposition of a number, Divisor of N, Euler function $\phi(N)$ highest power of a prime p contained in N

Unit II

Theory of equations: Polynomial equations – imaginary and irrational roots – relation between the roots symmetric function of roots in terms of coefficients – reciprocal equations – formation / of equations – transformation of equations – Descartes's rule of signs

Unit III

Curvature – radius of curvature in Cartesian and polar co-ordinates – center of curvature – Evolutes and involutes (p,r) equation of curves.

Unit IV

Definite integrals – reduction formulae – double integrals – change of order of integration – triple integrals

Unit V

Beta and gamma functions and the relation between them – integration using Beta and Gamma functions

Text Book:

Algebra, by T.K. Manickavasagam Pillai & others
Calculus by T.K. Manickavasagam Pillai & others

Reference Books:

1. Calculus by M.I. Francis Raj
2. Calculus by Edwards, D.J.
3. Differential and Integral Calculus by Shanthinarayanan
4. Theory of Equations by Khanna