CSS COURSE SYLLABUS

Pure Mathematics

100 marks · one paper · Group II - Sciences & Mathematics

Complete Pure Mathematics syllabus. The full official FPSC syllabus this course covers, section by section.

SECTION-A (40 MARKS)

1 Modern Algebra

- Group, subgroups, Lagranges theorem, Cyclic groups, Normal subgroups, Quotient groups. Fundamental theorem of homomorphism. Isomorphism theorems of groups, Inner automorphisms. Conjugate elements, conjugate subgroups. Commutator subgroups.
- Ring, Subrings, Integral domains, Quotient fields, Isomorphism theorems, Field extension and finite fields.
- Vector spaces, Linear independence, Bases, Dimension of a finitely generated space. Linear transformations, Matrices and their algebra. Reduction of matrices to their echelon form. Rank and nullity of a linear transformation.
- Solution of a system of homogeneous and non-homogeneous linear equations.
- Properties of determinants.

SECTION-B (40 MARKS)

2 Calculus & Analytic Geometry

- Real Numbers. Limits. Continuity. Differentiability. Indefinite integration. Mean value theorems. Taylor's theorem, Indeterminate forms. Asymptotes. Curve tracing.
- Definite integrals. Functions of several variables. Partial derivatives. Maxima and minima. Jacobnians, Double and triple integration (techniques only).Applications of Beta and Gamma functions. Areas and Volumes. Riemann-Stieltje's integral.
- Improper integrals and their conditions of existences. Implicit function theorem.
- Conic sections in Cartesian coordinates, Plane polar coordinates and their use to represent the straight line and conic sections. Cartesian and spherical polar coordinates in three dimensions. The plane, the sphere, the ellipsoid, the paraboloid and the hyperboloid in Cartesian and spherical polar coordinates.

SECTION-C (20 MARKS)

3 Complex Variables

- Function of a complex variable; Demoiver's theorem and its applications. Analytic functions, Cauchy's theorem. Cauchy's integral formula, Taylor's and Laurent's series.
- Singularities. Cauchy residue theorem and contour integration. Fourier series and Fourier transforms.

Source: Revised Syllabi for CSS Competitive Examination, CE-2016 (updated 7 July 2015), Federal Public Service Commission.

Practise answers on this syllabus and get them marked out of 20 at **cssprep.ai**. Questions? WhatsApp **+92 323 7805323**.

CSSPrep.AI cssprep.ai WhatsApp +92 323 7805323