ज्ञान-विज्ञान विमुक्तये

CSIR-UGC National Eligibility Test (NET)

for Junior Research Fellowship & Lecturer-ship

COMMON SYLLABUS FOR PART 'B' AND 'C'

MATHEMATICAL SCIENCES

CSIR NET Mathematics Syllabus for Part A

Part A is all about the general Paper which is common for all post. Some of the important topics of CSIR **NET Mathematical Science** are partial differential equations, numerical analysis, calculus of variations, linear integral equations, classical mechanics, descriptive statistics, exploratory data analysis, etc.

CSIR NET Mathematical Science Syllabus: Part A (General Aptitude)	
Graphical Analysis & Data Interpretation	Pie-Chart
	Line & Bar Chart
	Graph
	Mode, Median, Mean
	Measures of Dispersion
	Table
Reasoning	Puzzle
	Series Formation
	Clock and Calendar
	Direction and Distance
	Coding and Decoding
	Ranking and Arrangement
Numerical Ability	Geometry
	Proportion and Variation

	Time and Work
	HCF and LCM
	Permutation and Combination
	Compound and Simple Interest

CSIR NET Mathematics Syllabus for Part B & Part C

Here we are sharing the important topic which is asked in the CSIR NET Mathematical Science exam. Candidates may revise all the important topics before appearing for the main exam. Parts B & C majorly consist of the subject concerned part which is based on the domain of the students.

CSIR NET Mathematical Science Syllabus: Part B & Part C	
Unit 1	
Analysis	Elementary set theory, finite, countable, and uncountable sets, Real number system, Archimedean property, supremum, infimum.
	Sequence and series, convergence, limsup, liminf.
	Bolzano Weierstrass theorem, Heine Borel theorem
	Continuity, uniform continuity, differentiability, mean value theorem.
	Sequences and series of functions, uniform convergence.
	Riemann sums and Riemann integral, Improper Integrals.
Linear Algebra	Vector spaces, subspaces, linear dependence, basis, dimension, algebra of linear transformation
	Algebra of matrices, rank, and determinant of matrices, linear equations.
	Eigenvalues and eigenvectors, Cayley-Hamilton theorem.
	Matrix representation of linear transformations. Change of basis, canonical forms, diagonal forms, triangular forms, Jordan forms.
	Inner product spaces, orthonormal basis.
	Quadratic forms, reduction, and classification of quadratic forms

Unit 2	
Complex Analysis	Algebra of complex numbers, the complex plane, polynomials, power series, transcendental functions such as exponential, trigonometric, and hyperbolic functions
	Analytic functions, Cauchy-Riemann equations.
	Contour integral, Cauchy's theorem, Cauchy's integral formula, Liouville's theorem, Maximum modulus principle, Schwarz lemma, Open mapping theorem.
	Taylor series, Laurent series, calculus of residues.
	Conformal mappings, Mobius transformations.
Algebra	Permutations, combinations, pigeon-hole principle, inclusion-exclusion principle, derangements.
	Fundamental theorem of arithmetic, divisibility in Z, congruences, Chinese Remainder Theorem, Euler's Ø- function, primitive roots.
	Groups, subgroups, normal subgroups, quotient groups, homomorphisms, cyclic groups, permutation groups, Cayley's theorem, class equations, and Sylow theorems.
	Rings, ideals, prime and maximal ideals, quotient rings, unique factorization domain, principal ideal domain, Euclidean domain.
	Topology: basis, dense sets, subspace and product topology, separation axioms, connectedness, and compactness.
Unit 3	
Ordinary Differential Equations (ODEs):	Existence and uniqueness of solutions of initial value problems for first-order ordinary differential equations, singular solutions of first-order ODEs, and the system of first-order ODEs.
	A general theory of homogenous and non-homogeneous linear ODEs, variation of parameters, Sturm-Liouville boundary value problem, Green's function.

Partial Differential Equations (PDEs)	Lagrange and Charpit methods for solving first-order PDEs, Cauchy problem for first-order PDEs.
	Classification of second-order PDEs, General solution of higher-order PDEs with constant coefficients, Method of separation of variables for Laplace, Heat, and Wave equations.
Numerical Analysis	Numerical solutions of algebraic equations, Method of iteration and Newton-Raphson method, Rate of convergence, Solution of systems of linear algebraic equations using Gauss elimination and Gauss-Seidel methods, Finite differences, Lagrange, Hermite, and spline interpolation, Numerical differentiation and integration, Numerical solutions of ODEs using Picard, Euler, modified Euler and Runge-Kutta methods.
Calculus of Variations	Variation of a functional, Euler-Lagrange equation, Necessary and sufficient conditions for extrema.
	Variational methods for boundary value problems in ordinary and partial differential equations.
Linear Integral Equations	Linear integral equation of the first and second kind of Fredholm and Volterra type, Solutions with separable kernels. Characteristic numbers and eigenfunctions, resolvent kernel.
Classical Mechanics	Generalized coordinates, Lagrange's equations, Hamilton's canonical equations, Hamilton's principle and the principle of least action, Two-dimensional motion of rigid bodies, Euler's dynamical equations for the motion of a rigid body about an axis, theory of small oscillations.
Unit 4	
Descriptive Statistics, Exploratory Data Analysis	Markov chains with finite and countable state space, classification of states, limiting behavior of n-step transition probabilities, stationary distribution, Poisson, and birth-and-death processes.
	Standard discrete and continuous univariate distributions. sampling distributions, standard errors and asymptotic distributions, distribution of order statistics, and range.
	Methods of estimation, properties of estimators, confidence intervals. Tests of hypotheses: most powerful and uniformly most powerful tests, likelihood ratio tests. Analysis of discrete data and chi-square test of goodness of fit. Large sample tests.

	Simple nonparametric tests for one and two sample problems, rank correlation, and test for independence, Elementary Bayesian inference.
	Simple random sampling, stratified sampling, and systematic sampling. Probability is proportional to size sampling. Ratio and regression methods.
	Hazard function and failure rates, censoring and life testing, series and parallel systems.

CSIR NET Mathematics Exam Pattern

There is a negative marking of 25% in Parts A and B of CSIR NET Mathematical Science Subject, & there is no negative marking for Part C. Important topics include Combinations, Fundamental Theorem of Arithmetic, Divisibility in Z, Congruences, etc

Mathematical Sciences	Part A	Part B	Part C	Total
Total Questions	20	40	60	120
Max No of Questions to attempt	15	25	20	60
Marks for each correct answer	2	3	4.75	200
Negative marking	0.5	0.75	0	–

CSIR NET Mathematics Syllabus & Topic-Wise Weightage

Please refer to the table to know the total number of questions in each section & their marking scheme

Subject	Total marks	Negative Marking	Marking Scheme
Mathematical Science	**200**	Part A: -0.5	Part A: +2
		Part B: -0.75	Part B: +3
		Part C: No Negative Marking	Part C: +4.75

All students are expected to answer questions from **Unit I**. Students in mathematics are expected to answer additional questions from **Units II and III**. Students within statistics are expected to answer additional questions from **Unit IV.**

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MATHEMATICS COACHING IN CHANDIGARH FOR THE FOLLOWING REASONS.

- ✓ CSIR NET Mathematics is an exam conducted and administered across India.
- ✓ Firstly, Chandigarh is the most popular and reputed location for CSIR NET Mathematics training.
- ✓ A new batch starts every Month.
- ✓ Both early morning and evening batches are available.
- ✓ Special additional time for Doubt session classes.
- ✓ **CLASS DURATION**: Daily 3 to 5 Hours Sessions.
- ✓ **STUDY MATERIAL**: e.g. Full Booklets Set, Practice Sheets & Notes,
- ✓ **CLASS STRENGTH**: 15 students per Batch
- ✓ **DOUBT SESSIONS**: Daily (1:1)
- ✓ **MOCK TEST**: e.g.Prev-paper, Weekly Class Tests, Full Mock Tests
- ✓ Online Batch Access Free of Cost* (Complete Access)
- ✓ **HOSTEL/PG FACILITY**

ONLINE COACHING FOR CSIR NET MATHS:

- ✓ **Books & Study Material Sent by Courier.**
- ✓ Full Access to **Online Live Classes.**
- ✓ **Recorded Lectures** (Life Time)
- ✓ **Offline Download** (Save your Content)
- ✓ **Online Mock Test Series** (All India Ranking System)
- ✓ **Online Class Tests**. (Weekly Basis)
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