

3. The interview test is not intended to be a test either of the specialised or general knowledge of the candidates which has been already tested through their written papers. Candidates are expected to have taken an intelligent interest not only in their special subjects of academic study but also in the events which are happening around them both within and outside their own State or Country as well as in modern currents of thought and in new discoveries which should rouse the curiosity of well educated youth.

SECTION III

SYLLABI FOR THE EXAMINATION

NOTE : Candidates are advised to go through the Syllabus published in this Section for the Preliminary Examination and the Main Examination, as periodic revision of syllabus has been done in several subjects.

Part A—Preliminary Examination

Paper I - (200 marks)

Duration: Two hours

- ☐ Current events of national and international importance.
- ☐ History of India and Indian National Movement.
- ☐ Indian and World Geography-Physical, Social, Economic Geography of India and the World.
- ☐ Indian Polity and Governance-Constitution, Political System, Panchayati Raj, Public Policy, Rights Issues, etc.
- ☐ Economic and Social Development-Sustainable Development, Poverty, Inclusion, Demographics, Social Sector Initiatives, etc.
- ☐ General issues on Environmental ecology, Bio-diversity and Climate Change - that do not require subject specialization.
- ☐ General Science.

Paper II-(200 marks)

Duration : Two hours

- ☐ Comprehension;
- ☐ Interpersonal skills including communication skills;
- ☐ Logical reasoning and analytical ability;
- ☐ Decision making and problem solving;
- ☐ General mental ability;
- ☐ Basic numeracy (numbers and their relations, orders of magnitude, etc.) (Class X level), Data interpretation (charts, graphs, tables, data sufficiency etc. — Class X level);

Note 1 : Paper-II of the Civil Services (Preliminary) Examination will be a qualifying paper with minimum qualifying marks fixed at 33%.

Note 2 : The questions will be of multiple choice, objective type.

Note 3 : It is mandatory for the candidate to appear in both the Papers of Civil Services (Prelim) Examination for the purpose of evaluation. Therefore a candidate will be disqualified in case he/she does not appear in both the papers of Civil Services (Prelim) Examination.

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Part B—Main Examination

The main Examination is intended to assess the overall intellectual traits and depth of understanding of candidates rather than merely the range of their information and memory.

The nature and standard of questions in the General Studies papers (Paper II to Paper V) will be such that a well-educated person will be able to answer them without any specialized study. The questions will be such as to test a candidate's general awareness of a variety of subjects, which will have relevance for a career in Civil Services. The questions are likely to test the candidate's basic understanding of all relevant issues, and ability to analyze, and take a view on conflicting socio-economic goals, objectives and demands. The candidates must give relevant, meaningful and succinct answers.

The scope of the syllabus for optional subject papers (Paper VI and Paper VII) for the examination is broadly of the honours degree level i.e. a level higher than the bachelors' degree and lower than the masters' degree. In the case of Engineering, Medical Science and law, the level corresponds to the bachelors' degree.

Syllabi of the papers included in the scheme of Civil Services (Main) Examination are given as follows :—

QUALIFYING PAPERS ON INDIAN LANGUAGES AND ENGLISH

The aim of the paper is to test the candidates' ability to read and understand serious discursive prose, and to express his ideas clearly and correctly, in English and Indian language concerned.

The pattern of questions would be broadly as follows :

- (i) Comprehension of given passages.
- (ii) Précis Writing.
- (iii) Usage and Vocabulary.
- (iv) Short Essays.

Indian Languages:—

- (i) comprehension of given passages.
- (ii) Précis Writing.
- (iii) Usage and Vocabulary.
- (iv) Short Essays.
- (v) Translation from English to the Indian Language and vice-versa.

Note 1: The papers on Indian Languages and English will be of Matriculation or equivalent standard and will be of qualifying nature only. The marks obtained in these papers will not be counted for ranking.

Note 2: The candidates will have to answer the English and Indian Languages papers in English and the respective Indian language (except where translation is involved).

PAPER-I

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Essay: Candidates may be required to write essays on multiple topics. They will be expected to keep closely to the subject of the essay to arrange their ideas in orderly fashion, and to write concisely. Credit will be given for effective and exact expression.

PAPER-II

General Studies-I : Indian Heritage and Culture, History and Geography of the World and Society.

- ❑ Indian culture will cover the salient aspects of Art Forms, literature and Architecture from ancient to modern times.
- ❑ Modern Indian history from about the middle of the eighteenth century until the present—significant events, personalities, issues.
- ❑ The Freedom Struggle — its various stages and important contributors/contributions from different parts of the country.
- ❑ Post-independence consolidation and reorganization within the country.
- ❑ History of the world will include events from 18th century such as industrial revolution, world wars, redrawal of national boundaries, colonization, decolonization, political philosophies like communism, capitalism, socialism etc.— their forms and effect on the society.
- ❑ Salient features of Indian Society, Diversity of India.
- ❑ Role of women and women's organization, population and associated issues, poverty and developmental issues, urbanization, their problems and their remedies.
- ❑ Effects of globalization on Indian society.
- ❑ Social empowerment, communalism, regionalism & secularism.
- ❑ Salient features of world's physical geography.
- ❑ Distribution of key natural resources across the world (including South Asia and the Indian sub-continent); factors responsible for the location of primary, secondary, and tertiary sector industries in various parts of the world (including India).
- ❑ Important Geophysical phenomena such as earthquakes, Tsunami, Volcanic activity, cyclone etc., geographical features and their location—changes in critical geographical features (including water-bodies and ice-caps) and in flora and fauna and the effects of such changes.

PAPER-III

General Studies- II: Governance, Constitution, Polity, Social Justice and International relations.

- ❑ Indian Constitution—historical underpinnings, evolution, features, amendments, significant provisions and basic structure.
- ❑ Functions and responsibilities of the Union and the States, issues and challenges pertaining to the federal structure, devolution of powers and finances up to local levels and challenges therein.
- ❑ Separation of powers between various organs dispute redressal mechanisms and institutions.

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- ❑ Comparison of the Indian constitutional scheme with that of other countries.
- ❑ Parliament and State legislatures—structure, functioning, conduct of business, powers & privileges and issues arising out of these.
- ❑ Structure, organization and functioning of the Executive and the Judiciary—Ministries and Departments of the Government; pressure groups and formal/informal associations and their role in the Polity.
- ❑ Salient features of the Representation of People's Act.
- ❑ Appointment to various Constitutional posts, powers, functions and responsibilities of various Constitutional Bodies.
- ❑ Statutory, regulatory and various quasi-judicial bodies.
- ❑ Government policies and interventions for development in various sectors and issues arising out of their design and implementation.
- ❑ Development processes and the development industry —the role of NGOs, SHGs, various groups and associations, donors, charities, institutional and other stakeholders.
- ❑ Welfare schemes for vulnerable sections of the population by the Centre and States and the performance of these schemes; mechanisms, laws, institutions and Bodies constituted for the protection and betterment of these vulnerable sections.
- ❑ Issues relating to development and management of Social Sector/Services relating to Health, Education, Human Resources.
- ❑ Issues relating to poverty and hunger.
- ❑ Important aspects of governance, transparency and accountability, e-governance-applications, models, successes, limitations, and potential; citizens charters, transparency & accountability and institutional and other measures.
- ❑ Role of civil services in a democracy.
- ❑ India and its neighborhood- relations.
- ❑ Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.
- ❑ Effect of policies and politics of developed and developing countries on India's interests, Indian diaspora.
- ❑ Important International institutions, agencies and fora- their structure, mandate.

PAPER-IV

General Studies-III: Technology, Economic Development, Bio diversity, Environment, Security and Disaster Management

- ❑ Indian Economy and issues relating to planning, mobilization, of resources, growth, development and employment.
- ❑ Inclusive growth and issues arising from it.

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- ❑ Government Budgeting.
- ❑ Major crops-cropping patterns in various parts of the country, - different types of irrigation and irrigation systems storage, transport and marketing of agricultural produce and issues and related constraints; e-technology in the aid of farmers.
- ❑ Issues related to direct and indirect farm subsidies and minimum support prices; Public Distribution System- objectives, functioning, limitations, revamping; issues of buffer stocks and food security; Technology missions; economics of animal-rearing.
- ❑ Food processing and related industries in India- scope' and significance, location, upstream and downstream requirements, supply chain management.
- ❑ Land reforms in India.
- ❑ Effects of liberalization on the economy, changes in industrial policy and their effects on industrial growth.
- ❑ Infrastructure: Energy, Ports, Roads, Airports, Railways etc.
- ❑ Investment models.
- ❑ Science and Technology- developments and their applications and effects in everyday life.
- ❑ Achievements of Indians in science & technology; indigenization of technology and developing new technology.
- ❑ Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.
- ❑ Conservation, environmental pollution and degradation, environmental impact assessment.
- ❑ Disaster and disaster management.
- ❑ Linkages between development and spread of extremism.
- ❑ Role of external state and non-state actors in creating challenges to internal security.
- ❑ Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, basics of cyber security; money-laundering and its prevention.
- ❑ Security challenges and their management in border areas - linkages of organized crime with terrorism.
- ❑ Various Security forces and agencies and their mandate.

PAPER-V

General Studies- IV: Ethics, Integrity and Aptitude

This paper will include questions to test the candidates' attitude and approach to issues relating to integrity, probity in public life and his problem solving approach to various issues and conflicts faced by him in dealing with society. Questions may utilise the case study approach to determine these aspects. The following broad areas will be covered :

- ❑ Ethics and Human Interface: Essence, determinants and consequences of Ethics in-human actions; dimensions of ethics; ethics - in private and public relationships. Human Values - lessons from the lives and teachings of great leaders, reformers and administrators; role of

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family society and educational institutions in inculcating values.

- ☐ Attitude: content, structure, function; its influence and relation with thought and behaviour; moral and political attitudes; social influence and persuasion.
- ☐ Aptitude and foundational values for Civil Service, integrity, impartiality and non-partisanship, objectivity, dedication to public service, empathy, tolerance and compassion towards the weaker-sections.
- ☐ Emotional intelligence-concepts, and their utilities and application in administration and governance.
- ☐ Contributions of moral thinkers and philosophers from India and world.
- ☐ Public/Civil service values and Ethics in Public administration: Status and problems; ethical concerns and dilemmas in government and private institutions; laws, rules, regulations and conscience as sources of ethical guidance; accountability and ethical governance; strengthening of ethical and moral values in governance; ethical issues in international relations and funding; corporate governance.
- ☐ Probity in Governance: Concept of public service; Philosophical basis of governance and probity; Information sharing and transparency in government, Right to Information, Codes of Ethics, Codes of Conduct, Citizen's Charters, Work culture, Quality of service delivery, Utilization of public funds, challenges of corruption.
- ☐ Case Studies on above issues.

PAPER-VI & PAPER VII

Optional Subject Papers I & II

Candidate may choose any optional subject from amongst the List of Optional Subjects given in Para 2.

AGRICULTURE

PAPER-I

Ecology and its relevance to man, natural resources, their sustainable management and conservation. Physical and social environment as factors of crop distribution and production. Agro ecology; cropping pattern as indicators of environments. Environmental pollution and associated hazards to crops, animals and humans. Climate change—International conventions and global initiatives. Green house effect and global warming. Advance tools for ecosystem analysis—Remote Sensing (RS) and Geographic Information Systems (GIS).

Cropping patterns in different agro-climatic zones of the country. Impact of high-yielding and short-duration varieties on shifts in cropping patterns. Concepts of various cropping, and farming systems. Organic and Precision farming. Package of practices for production of important cereals, pulses, oil seeds, fibres, sugar, commercial and fodder crops.

Important features, and scope of various types of forestry plantations such as social forestry, agro-forestry, and natural forests : Propagation of forest plants. Forest products. Agro-forestry and value addition. Conservation of forest flora and fauna.

Weeds, their characteristics, dissemination and association with various crops; their

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Concept of core competence, Strategic flexibility; Reinventing strategy; Strategy and structure; chief Executive and Board; turnaround management; Management of strategic change; Strategic alliances, Mergers and Acquisitions; Strategy and corporate evolution in the Indian context.

6. International Business :

International Business Environment : Changing composition of trade in goods and services; India's Foreign Trade: Policy and trends; Financing of International trade; Regional Economic Cooperation; FTAs; Internationalisation of service firms; International production; Operation Management in International companies; International Taxation; Global competitiveness and technological developments; Global E-Business; Designing global organisational structure and control; Multicultural management; Global business strategy; Global marketing strategies; Export Management; Export-Import procedures; Joint Ventures; Foreign Investment: Foreign direct investment and foreign portfolio investment; Cross-border Mergers and Acquisitions; Foreign Exchange Risk Exposure Management; World Financial Markets and International Banking; External Debt Management; Country Risk Analysis.

MATHEMATICS

PAPER I

(1) Linear Algebra :

Vector spaces over \mathbb{R} and \mathbb{C} , linear dependence and independence, subspaces, bases, dimensions, Linear transformations, rank and nullity, matrix of a linear transformation.

Algebra of Matrices; Row and column reduction, Echelon form, congruence's and similarity; Rank of a matrix; Inverse of a matrix; Solution of system of linear equations; Eigenvalues and eigenvectors, characteristic polynomial, Cayley-Hamilton theorem, Symmetric, skew-symmetric, Hermitian, skew-Hermitian, orthogonal and unitary matrices and their eigenvalues.

(2) Calculus :

Real numbers, functions of a real variable, limits, continuity, differentiability, mean-value theorem, Taylor's theorem with remainders, indeterminate forms, maxima and minima, asymptotes; Curve tracing; Functions of two or three variables; Limits, continuity, partial derivatives, maxima and minima, Lagrange's method of multipliers, Jacobian.

Riemann's definition of definite integrals; Indefinite integrals; Infinite and improper integral; Double and triple integrals (evaluation techniques only); Areas, surface and volumes.

(3) Analytic Geometry :

Cartesian and polar coordinates in three dimensions, second degree equations in three variables, reduction to Canonical forms; straight lines, shortest distance between two skew lines, Plane, sphere, cone, cylinder, paraboloid, ellipsoid, hyperboloid of one and two sheets and their properties.

(4) Ordinary Differential Equations :

Formulation of differential equations; Equations of first order and first degree, integrating factor; Orthogonal trajectory; Equations of first order but not of first degree, Clairaut's equation, singular solution.

Second and higher order linear equations with constant coefficients, complementary function, particular integral and general solution.

Second order linear equations with variable coefficients, Euler-Cauchy equation;

Determination of complete solution when one solution is known using method of variation of parameters.

Laplace and Inverse Laplace transforms and their properties, Laplace transforms of elementary functions. Application to initial value problems for 2nd order linear equations with constant coefficients.

(5) Dynamics and Statics :

Rectilinear motion, simple harmonic motion, motion in a plane, projectiles; Constrained motion; Work and energy, conservation of energy; Kepler's laws, orbits under central forces.

Equilibrium of a system of particles; Work and potential energy, friction, Common catenary; Principle of virtual work; Stability of equilibrium, equilibrium of forces in three dimensions.

(6) Vector Analysis :

Scalar and vector fields, differentiation of vector field of a scalar variable; Gradient, divergence and curl in cartesian and cylindrical coordinates; Higher order derivatives; Vector identities and vector equation.

Application to geometry : Curves in space, curvature and torsion; Serret-Frenet's formulae.

Gauss and Stokes' theorems, Green's identities.

PAPER II

(1) Algebra :

Groups, subgroups, cyclic groups, cosets, Lagrange's Theorem, normal subgroups, quotient groups, homomorphism of groups, basic isomorphism theorems, permutation groups, Cayley's theorem.

Rings, subrings and ideals, homomorphisms of rings; Integral domains, principal ideal domains, Euclidean domains and unique factorization domains; Fields, quotient fields.

(2) Real Analysis :

Real number system as an ordered field with least upper bound property; Sequences, limit of a sequence, Cauchy sequence, completeness of real line; Series and its convergence, absolute and conditional convergence of series of real and complex terms, rearrangement of series. Continuity and uniform continuity of functions, properties of continuous functions on compact sets.

Riemann integral, improper integrals; Fundamental theorems of integral calculus.

Uniform convergence, continuity, differentiability and integrability for sequences and series of functions; Partial derivatives of functions of several (two or three) variables, maxima and minima.

(3) Complex Analysis :

Analytic function, Cauchy-Riemann equations, Cauchy's theorem, Cauchy's integral formula, power series, representation of an analytic function, Taylor's series; Singularities; Laurent's series; Cauchy's residue theorem; Contour integration.

(4) Linear Programming :

Linear programming problems, basic solution, basic feasible solution and optimal solution; Graphical method and simplex method of solutions; Duality.

Transportation and assignment problems.

(5) Partial Differential Equations :

Family of surfaces in three dimensions and formulation of partial differential equations; Solution of quasilinear partial differential equations of the first order, Cauchy's method of characteristics; Linear partial differential equations of the second order with constant coefficients, canonical form; Equation of a vibrating string, heat equation, Laplace equation and their solutions.

(6) Numerical Analysis and Computer Programming :

Numerical methods: Solution of algebraic and transcendental equations of one variable by bisection, Regula-Falsi and Newton-Raphson methods, solution of system of linear equations by Gaussian Elimination and Gauss-Jordan (direct), Gauss-Seidel (iterative) methods. Newton's (forward and backward) and interpolation, Lagrange's interpolation.

Numerical integration: Trapezoidal rule, Simpson's rule, Gaussian quadrature formula.

Numerical solution of ordinary differential equations : Euler and Runge Kutta methods.

Computer Programming : Binary system; Arithmetic and logical operations on numbers; Octal and Hexadecimal Systems; Conversion to and from decimal Systems; Algebra of binary numbers.

Elements of computer systems and concept of memory; Basic logic gates and truth tables, Boolean algebra, normal forms.

Representation of unsigned integers, signed integers and reals, double precision reals and long integers.

Algorithms and flow charts for solving numerical analysis problems.

(7) Mechanics and Fluid Dynamics :

Generalised coordinates; D'Alembert's principle and Lagrange's equations; Hamilton equations; Moment of inertia; Motion of rigid bodies in two dimensions.

Equation of continuity; Euler's equation of motion for inviscid flow; Stream-lines, path of a particle; Potential flow; Two-dimensional and axisymmetric motion; Sources and sinks, vortex motion; Navier-Stokes equation for a viscous fluid.

MECHANICAL ENGINEERING

PAPER I

1. Mechanics :

1.1 Mechanics of Rigid Bodies :

Equations of equilibrium in space and its application; first and second moments of area; simple problems on friction; kinematics of particles for plane motion; elementary particle dynamics.

1.2 Mechanics of Deformable Bodies :

Generalized Hooke's law and its application; design problems on axial stress, shear stress and bearing stress; material properties for dynamic loading; bending shear and stresses in beams; determination of principle stresses and strains-analytical and graphical; compound and combined stresses; bi-axial stresses-thin walled pressure vessel; material behaviour and design factors for dynamic load; design of circular shafts for bending and torsional load only; deflection of beam for statically determinate problems; theories of failure.

2.Engineering Materials :

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