

COMPONENTS OF ENTRANCE EXAMINATION

The Entrance test will be discipline specific and aimed to assess the knowledge of the subject in which the applicant wants to seek the admission. It will have four sections as specified by the concerned department (60 MCQ type questions of one mark each).

1. There shall be no negative marking.
2. The candidate will have to choose one correct answer and mark on OMR sheet. However if a candidate marks multiple entries in the OMR sheet for particular question(s), it will be treated as cancelled.
3. Each correct answer will carry 01 mark.
4. In case a candidate appears in subject other than that specified in his/her application form/admit card, his/her exam will be cancelled. It is the responsibility of the candidate to appear in correct paper prescribed for the chosen Programme of Study.
5. Use of any unfair means shall automatically disqualify the candidate from the entrance examination 2017.

SYLLABUS FOR ENTRANCE TEST 2017

MA (English Language & Literature)

Section A: Major Literary Terms

Section B: Major Poets (John Milton, Alexander Pope, William Wordsworth, William Blake, John Keats, Robert Frost, Rabindranath Tagore, Derek Walcott, Alfred Lord Tennyson and Robert Browning)

Section C: Major Novelists (Jane Austen, Charles Dickens, Thomas Hardy, R.K. Narayan, Kamla Markandya, Mark Twain, Charlotte Bronte, Virginia Woolf, V.S. Naipaul, William Golding, Bhishm Sahani)

Section D: Major Dramatists (William Shakespeare, Christopher Marlowe, G.B. Shaw, John Osborne, Harold Pinter, Vijay Tendulkar, Sophocles, Samuel Beckett, Bertolt Brecht, Arthur Miller)

MA (Hindi)

- हिन्दी साहित्य का इतिहास
- हिन्दी भाषा का विकास
- हिन्दी कथा साहित्य (कहानी + उपन्यास)
- काव्य शास्त्र (भारतीय + पाश्चात्य)

MA (Sanskrit)

- वैदिकवाङ्मयः संहिताः, ब्राह्मणानि, आरण्यकाणि, उपनिषदः, वेदाङ्गानि
- व्याकरणम् : शब्द-धातुरूपाणि, सन्धि-कारक-समासाः, प्रत्ययाः, अनुवादः
- संस्कृतसाहित्यम् : काव्यानि, नाटकानि, छन्दांसि, अलङ्काराः, कविपरिचयः
- पुराणेतिहासं दर्शनानि च: रामायणम्, महाभारतम्, श्रीमद्भगवद्गीता, षड्दर्शनानि, स्मृतयः, पुराणानि

MA (Journalism and Creative Writing) and MA (New Media Communications)

1. General Awareness

History of Media, Prominent Personalities Associated with Print Media, and other Media related issues.

2. Current Affairs

Current Debates on Media, Awards & Honours, Policy Matters, latest happenings and other Media related issues

3. Print Media

Reporting, Editing, Media Management, Development Journalism, Public Relations, Advertising, Film.

4. Electronic Media

Television and Radio Production, Online Media, Production Techniques, Digital Broadcasting.

M.Sc. (Computational Biology and Bioinformatics)

Considering the interdisciplinary and integrative nature of the subject and to give equal opportunity to students coming from various disciplines, the questions requiring thinking and analysis in the following subjects will be asked in the entrance exam and equal weightage will be given to each paper. Following will be the composition:

All the above sections will be given equal proportion and the questions will be designed from the **bachelor's level syllabus.**

	Subject	Number of Questions
1.	Physics	20%
2.	Chemistry	20%
3.	Mathematics (including Statistics)	20%
4.	Computer Sciences	20%
5.	Biology (Botany, Zoology, Biochemistry, Molecular Biology, Genetics, Microbiology etc.)	20%

MA (Economics)

- **General Economic Awareness** Indicators of Growth and Development, Trends in Poverty, Unemployment and Economic Growth in India, Indian Economic Institutions (Objectives, Functions & Organizational Structure): Planning Commission (Niti Ayog), Finance Commission, Reserve Bank of India, Economic Reforms in India, Trends in Liberalization, Privatization and Globalization in India, Exports and Imports in India, World Trade Organization (WTO) Agreement, International Economic Institutions (Objectives & Functions): World Bank, International Monetary Fund (IMF)
- **Mathematics I**
Set Theory, Linear and Quadratic Equations, Functions, Exponential and Logarithmic Functions, Matrix Operation (Addition, Subtraction, and Multiplication)
- **Mathematics II**
Limits & Continuity, Derivatives, Higher Order Derivatives, Partial Derivatives, Maximum/Minimum of a Function (One variable), Integration
- **Statistics**
Univariate distributions: Frequency table, Histogram
Central tendency: Mean, Median, Mode, Harmonic Mean, and Geometric Mean.
Measures of Dispersion: Range, Interquartile range (IQR), Mean deviation, Standard deviation, Coefficient of variation (CV),
Correlation Analysis- Simple correlation, Partial correlation (three variables), multiple correlation (three variables), and Rank correlation

Probability: Basic concepts of probability, Venn diagram, Joint probability, Conditional probability, Permutations and Combinations

M.Sc. (Information Technology)

Section-A (30 % weightage)

Fundamental of Computer: History of computer, classification of computer, characteristics of computer, application of computer, hardware, software, firmware, CPU, memory hierarchy, I/O devices, number system, Boolean algebra, introduction to internet and email.

Programming in C and C++: Control structures, data structures (arrays, records included), data types, and functions, subroutines, parameter passing mechanism, Pointers, scope and lifetime of variables. Procedural and Problem oriented programming languages, Top-Down Programming, Bottom-up programming, Object Oriented Programming, Essentials of OOPs (Encapsulation, Overloading, Inheritance, Polymorphism) Object, Classes, Constructors, Destructors, and Exception Handling.

Computer Architecture: Overview of basic digital building blocks; basic structure of a digital computer. Combinatorial logic (multiplexers, decoders, encoders comparators, arithmetic operators included) sequential circuits (flip flops, counter and shift register).

Section-B (30 % weightage)

Computer organization: Introduction, system buses and instructions cycles, memory subsystem organization and interfacing, and I/O subsystem organizations.

Basics of Operating System: Introduction of operating system, classification of operating system, Structure of operating system, Process management and scheduling, memory management, file systems, IO management.

Data Communication & Computer Networks: Introduction, data Transmission mode- simplex, half duplex, full duplex, analog and digital signal, transmission media, network reference model and architecture (OSI and TCP/IP), networks types (LAN, MAN and WAN), network topologies, components of network.

Database Management System: Basics of data management systems, database models, relational algebra, relational calculus, normalization, and SQL.

Section –C (20% weightage)

Mathematics: General Mathematics up to CBSE XII standard.

Section –D (20% weightage)

Physics: General Physics up to CBSE XII standard.

Master of Social Work (MSW)

- **Sociological Concepts and Social Problems**
Society, Community, Groups – Definition, Types; Types of Society, Social Institutions, Groups and its Type
Social Problems: Poverty, Unemployment, Drug Addiction, Old Age & Destitution, Corruption, Domestic Violence, Displacement, Harassment & Abuse in workplace;
Communism, Secularism & Socialism
- **Social Change & Social Reform** Social Reform Movements
Social Reformers: Mahatma Gandhi, Vinoba Bhave, Ambedkar, Vivekanand, Raja Ram Mohan Roy, Mother Teresa, etc. and their contribution
Social Legislation – RTI, Domestic Violence, POSCO, and Legislation related to SC/ST, Juvenile Justice Act, Lokpal, Legal Aid & Public Interest Litigation.
Non-governmental Organizations
- **Indian Polity, Social Policy & Social Development** Constitution of India: Fundamental Rights, DPSP, Fundamental Duties; Constitutional provisions and safeguards for SCs, STs, OBCs, Women & Children; Panchayati Raj System;
Human Rights: Institutions, International Conventions
Social welfare and social development: Recent Policies and Programmes
Information Communication Technology
Health – Epidemiology, Communicable disease, Health Systems, Health Indicators

- Community Development
- **Social Research** Basics of Research Methodology, Nature & Types of Research Science & Scientific Method; Research Design, Sampling, Techniques of Data Collection; Basic Statistics : Mean, Median & Mode

M. Sc. (Mathematics)

- **Mathematical Analysis:** Sequence and series of real numbers, Mean value theorem, Maxima and minima of functions of a single variable and several variables, Open and closed sets, limit points, completeness of \mathbb{R} , Uniform Continuity and convergence, Power series, proper and improper integrals, Fundamental theorem of calculus, Gradient, divergence, curl and Laplacian, Green's, Stokes and Gauss theorems and their applications.
- **Ordinary and Partial Differential Equations:** First order ODEs, Initial value problems, Linear ODEs with constant and variable coefficients, Method of variation of parameters, first order linear PDEs and Lagrange method, Linear PDEs with constant and variable coefficients.
- **Complex Analysis:** Algebra of complex numbers, Analytic functions, Cauchy-Riemann equations, Contour integral, Cauchy's theorem, Cauchy's integral formula, Liouville's theorem, Taylor series, Laurent series, singularities, calculus of residues, Conformal mappings.
- **Linear Algebra and Algebra:** Systems of linear equations. Matrices, rank, determinant, inverse. Eigenvalues and eigenvectors. Finite Dimensional Vector Spaces over Real and Complex Numbers, Basis, Dimension, Linear Transformations, Groups, subgroups and normal subgroups, Lagrange's Theorem for finite groups, group homomorphisms and basic concepts of quotient groups, rings, ideals, quotient rings and fields.

MBA (Specialisation in Tourism and Travel)

SECTION-A Himachal Pradesh as a Tourist Destination

- Geography of Himachal Pradesh, Climate, People, Language, Population.
- Important Fairs and Festivals, Performing Arts, Wildlife, Cuisine, Temples, Churches, Gurudwara, Monasteries, Adventure tourism places and important tourism Circuits of Himachal Pradesh

SECTION-B Tourism Product of India

- Heritage Tourism products of India: Forts, Palaces, other architectural marvels etc.
- Religious Tourism Products of India: Temples, Mosques, Churches, Gurudwara etc.
- Natural Tourism Resources in India: Landforms (mountains, deserts, beaches, coastal areas and Islands), Water bodies and biotic wealth (flora – fauna), wildlife etc.

SECTION-C Indian Culture and Society

- Cultural Tourism Resources in India: Indian History, Traditions, Customs and costumes, cuisine. Music, Dance forms; painting, Craftsmanship etc.
- Contemporary tourism destinations for adventure tourism, eco-tourism, health tourism etc.

SECTION-D World Tourism Destinations

- Major popular tourism destinations of the world

MSc (Physics)

SECTION-A

Mathematical methods

Infinite sequences and series - convergence and divergence, conditional and absolute convergence, ratio test for convergence.

Calculus of single and multiple variable, Partial derivatives, Jacobian, Imperfect and perfect differentials. Taylor Expansion.

Vector algebra, Vector Calculus, Multiple integrals, Divergence theorem, Green's theorems, Stokes' theorem, Orthogonal coordinate systems.

First order equations and linear second order differential equations with constant coefficients.

Linear vector spaces, linear independence, basis. Matrices and determinants, Hermitian adjoint and inverse of a matrix; Hermitian, orthogonal, and unitary matrices; Eigenvalue and eigenvectors.

Fourier expansion – statement of Dirichlet's condition, analysis of simple waveforms with Fourier series.

Probability distributions and error analysis.

Classical mechanics and general properties of matter

Newton's laws of motion and applications, Velocity and acceleration in Cartesian, Polar and cylindrical coordinate systems. Uniformly rotating frame, Centrifugal and Coriolis forces.

System of particles, Center of mass, Equation of motion of the CM, Conservation of linear and angular momentum, Conservation of energy, Variable mass systems

Motion under a central force, Kepler's laws, Gravitational Law and field, Conservative and non-conservative forces

Elastic and inelastic collisions.

Differential equation for simple harmonic oscillator and its general solution, Superposition of two or more simple harmonic oscillators, Lissajous figures, Damped and forced oscillators, resonance, Wave equation, travelling and standing waves in one dimension, Energy density and energy transmission in waves, Group velocity and phase velocity, Sound waves in media, Doppler Effect.

Rigid body motion, Euler angles, Fixed axis rotations. Moments of Inertia and products of Inertia, Parallel and perpendicular axes theorem, Principal moments and axes.

Kinematics of moving fluids, Equation of continuity, Euler's equation, Bernoulli's theorem.

SECTION-B

Optics

Fermat's Principle, General theory of image formation, Thick lens, Thin lens and lens combinations.

Huygen's principle, Interference of light, Optical path retardation, interferometers.

Fraunhofer diffraction, Rayleigh criterion and resolving power, Diffraction gratings.

Linear, Circular and elliptic polarization, Double refraction and optical rotation.

Lasers, principle and working.

Electricity and magnetism

Electricity and Magnetism: Coulomb's law, Gauss's law, Electric field and potential

Electrostatic boundary conditions, Solution of Laplace's equation for simple cases.

Conductors, Capacitors, Dielectrics, Dielectric polarization

Volume and surface charges, energy stored in Electromagnetic field

Biot-Savart law, Ampere's law, Faraday's law of electromagnetic induction, Self and mutual inductance. Alternating currents, Simple DC and AC circuits with R, L and C components.

Displacement current, Maxwell's equations and plane electromagnetic waves, Poynting's theorem.

Lorentz Force and motion of charged particles in electric and magnetic fields.

Reflection and refraction at a dielectric interface, Transmission and reflection coefficients.

SECTION-C

Modern Physics

Inertial frames and Galilean invariance, Postulates of special relativity, Lorentz transformations, Length contraction, Time dilation, Relativistic velocity addition theorem, Mass energy equivalence.

Blackbody radiation, Planck's law, Rayleigh- Jeans and Wein's law, Photoelectric effect, Compton Effect.

Bohr's atomic model, Sommerfeld's correction, X-rays.

Wave-particle duality, Uncertainty principle.

Wave function and its interpretation, wave packets, Dynamical variables as operators, measurement of observables, expectation values. Commutation relations between operators and compatibility, observables and simultaneous measurements, Ehrenfest's theorem.

Schrödinger equation and its solution for one, two and three dimensional boxes, Solution of Schrödinger equation for the one dimensional harmonic oscillator, Reflection and transmission at a step potential.

Nuclear and Particle Physics

General Properties of Nuclei, Nuclear Models: liquid drop model, condition of nuclear stability. Experimental evidence for nuclear magic numbers, elementary accounts of nuclear shell model and its predictions, Radioactivity, qualitative account of the theory of alpha decay and beta decay, Interaction of Nuclear Radiation with matter: Energy loss due to ionization energy loss of electrons, Cerenkov radiation, Rutherford scattering, multiple coulomb scattering, passage of gamma- rays through matter. Compton scattering, pair production radiation loss by fast electrons, Radiation length and electron-gamma showers, position annihilation, Relativistic Kinematics. Particles Accelerators and Detectors, classification of elementary particles, Types of interactions and its features, Mass spectra and major decays of elementary particle: leptons, mesons, baryons, Weak and electromagnetic Decays of Strange mesons and Hyperons. Classification of weak decays and selection rules.

SECTION-D

Atomic and Molecular Spectroscopy

Good quantum numbers and selection rules. Stern-Gerlach experiment, Fine structure.

Magnetic moment of the electron, Lande g factor. Vector model – space quantization. Zeeman effect. Explanation from vector atom model.

Pauli exclusion principle, shell structure. Hund's rule, spectroscopic terms of many electron atoms in the ground state, Spectra of alkali and alkaline earth atoms. Rotational and vibrational spectra, Raman effect, Stokes and anti-stokes lines, complimentary character of Raman and Infrared spectra, experimental arrangements for Raman spectroscopy.

Kinetic Theory of Gases and Thermodynamics

Elements of Kinetic theory of gases. Velocity distribution and Equipartition of energy. Specific heat of Mono-, di- and tri-atomic gases. Ideal gas, van-der-Waals gas and equation of state. Mean free path.

Laws of thermodynamics. Zeroth law and concept of thermal equilibrium. First law and its consequences. Isothermal and adiabatic processes. Reversible, irreversible and quasi-static processes. Second law and entropy. Carnot cycle. Maxwell's thermodynamic relations and simple applications. Thermodynamic potentials and their applications. Phase transitions and Clausius-Clapeyron equation. Ideas of ensembles, Maxwell-Boltzmann, Fermi-Dirac and Bose-Einstein distributions.

Solid State Physics and Electronics

Basics of Crystal Structure: Lattice and basis, primitive and unit cell, Wigner Seitz cell, symmetry operations, lattice types, packing fraction, Miller indices, simple structures NaCl, diamond. Diffraction Methods: Bragg's Law, experimental arrangements, Laue equation, reciprocal lattice, atomic scattering factor, geometrical structure factors. Crystal bonding: Potential between a pair of atoms, Lennard-Jones potential, Ionic, Covalent, Vander - Waal's, cohesive energy, Lattice Vibration, specific heat Einstein and Debye's models of specific heat. Free electron theory of metals, Band Theory of Metals: Kronig Penny model, Brillouin zones, electrons in periodic structure, energy bands, energy gaps, effective mass of electrons and holes, metals, insulators, semiconductors, Magnetism, Curie-Weiss law, Langevin theory, basics of superconductivity.

Junction Diodes, Transistors their characteristics and simple circuit designs: Thevenin's Theorem, Norton Theorem, Constant Voltage and current generator, idea of equivalent circuits, low frequency equivalent circuits, h-parameters, bias stability, thermal runaway. BJT, FET's and MOSFETS: Structure and working, FET amplifier. Oscillators: Tuned Collector, Hartley and Colpitts oscillators, phase shift

oscillators. Operational Amplifier, inverting noninverting amplifier, OP-Amp as adder, subtractor, comparator, integrator and differentiator. Modulation and detection, Digital electronics fundamentals, various number systems, Basic logic gates, de-Morgan's law

MSc (Environmental Sciences)

Section A: Law of Motion, Work, Energy and Power, Gravitation; Gas Laws, The First Law of Thermodynamics, Joule's Law, Specific Heats, Enthalpy, Adiabatic Processes; The Spectrum of Radiation, Blackbody Radiation, The Planck Function, Wien's Displacement Law, The Stefan-Boltzmann Law, Kirchhoff's Law, Beer's Law; Interaction of light with matter: Transmission, Absorption, Scattering; Beer-Lambert's Law; Atomic Absorption and Atomic Emission Spectra, X-Rays and Interaction of X-Rays with Matter. Single variable calculus: domain and range, maxima and minima, continuity, differentiability, integration; matrices and determinants; eigen values and eigenvectors; permutation and combination; ordinary differential equations with constant coefficients; analytic functions; groups and subgroups.

Section B: Microbes-diversity, structure and reproduction. General account of infection, Phytoimmunology; Microbiology-Role in agriculture, industry, medicine and pollution combatment; Important plant diseases caused by viruses, bacteria, fungi and nematodes; Cryptogams and Gymnosperms-classification, distribution, diversity, structure and reproduction from evolutionary view point; Angiosperms- Systematics, anatomy, embryology, palynology and phylogeny; various systems of Classification; Non-chordata and chordates- General characters, nutrition, locomotion, reproduction of Protozoa, Coelenterata, Platyhelminthes, Nematelminthes, Annelida, Arthropoda, Mollusca, and Echinodermata, comparative study of Pisces, Amphibia, Reptilia and Mammalia; Cell and Molecular Biology-Techniques of Cell Biology, Prokaryotic and eukaryotic cells, Linkage and crossing over-methods of gene mapping including molecular maps; sex determination and molecular basis of sex differentiation, Mutations; Organic evolution; Ecology- Ecosystem structure and function of ecosystem, food chains, food webs and ecological succession; Ecological factors, Concepts and dynamics of community, Plant succession, Concepts of biosphere, Ecosystems and their conservation, Pollution, afforestation, deforestation and social forestry, Endangered plants, endemism and Red Data Books, Biodiversity- Convention of Biological Diversity and Conservation, Sovereign Rights and Intellectual Property Rights, Biogeochemical cycles.

Section C : Element and periodicity, reaction mechanism, ionic, covalent and complex compounds , alkane, alkene , alkyne and aromatic compounds. Heterocyclic compounds, Homolytic and heterolytic fission , chemical kinetics.

Environmental studies its scope and importance; Concept of sustainability and sustainable development. Natural Resources Renewable and Non-renewable Resources and its conservation; Environmental Pollution; Environmental Legislations - national and international ; Current environmental Issues- Climate change, global warming, ozonolayer depletion, acid rain and impacts on human communities and agriculture.

Section D : Modern theories on the origin of the Earth; Internal structure of Earth; Theory of Plate tectonics and its implications in understanding mountain building and sea floor spreading processes; Folds and Faults; Natural hazards; Introduction to rocks and minerals. Different types of rocks and their characteristics; Rock-forming minerals; weathering and erosion of rocks and minerals; Geological Time Scale and associated geological events; Biogeochemical cycle; Physical work of river, wind, glacier, sea and lake; basic hydrology; engineering geology; environmental geology.

MBA

Section A: Data Analysis and Numerical Aptitude:

- Data analysis and interpretation based on text, graphs and tables,
- Time, Speed, Distance, Ratios and Proportions
- Profit & Loss, Simple and Compound Interest
- Elementary Statistics

Section B: Business Awareness:

- Indian Business Environment
- Legends of Business and Business Corporate
- Current Issues in Business
- Famous Awards and Prizes in Business
- International Institutions
- Brand, Trademarks and Advertisements

Section C: Business Communication:

- Business Writing
- Business Vocabulary
- Pronouns and Misplaced Modifiers
- Sentence Completion
- Synonym and Antonyms

Section D: General Knowledge:

- National Statistics
- Economic Geography
- Famous Books and Authors
- Sports
- Current Affairs

Master of Library Science (M.Lib. Sc.)

SECTION-A

Types of library systems

- Role of libraries in the contemporary society
- National libraries features, functions & activities
- Academic libraries features, functions & activities
- Special libraries features, functions & activities
- Public libraries features, functions & activities

SECTION- B

Knowledge, Information and Data; Types of societies

- Data types
- Primary, secondary and tertiary information
- Types of knowledge
- Agricultural society, industrial society
- Knowledge society

SECTION-C

Information sources

- Difference between ordinary book and reference book
- Difference between Journal and Magazine
- Difference between indexing service and abstracting service
- Difference between handbook and directory
- Difference between thesis and dissertation
- Difference between patent and standard

SECTION-D

Computer Fundamentals

- Computer Organisation
- Generations of Computers
- Classification of computers
- Computer memory: RAM, ROM
- Secondary Storage: Characteristics of Hard disk and CD-ROM, DVDs, Blue-ray Disks

- Printers and Scanners; Types and characteristics
- Types of software.

MA (Sociology)

SECTION-A

Introduction to Sociology, Human Society, Culture, and Socialization: Definition, Nature, Relationship of Sociology with other Social Sciences, Human Society, Social Groups, Association, Community, Caste and Social Stratification, Culture and Civilization, Cultural Lag, Conceptual Understanding of Acculturation, Assimilation and Socialization.

SECTION-B

Social Structure and Change: Status and Role, Social Change: Types of Social Change: Evolution (Comte), Revolution (Marx). Processes of Social Change: Sanskritization, Westernization, Modernization, Secularization and Globalization.

SECTION-C

Rural and Urban Society: Family, Marriage, Kinship, Cultural Change, Economy and Polity (Village Panchayat). Urban Society: Concepts of Urbanization and Urbanism, Urban family, Voluntary associations, Slums, Crime, Pluralism and Cultural diversity, Industrialization, population growth and Social Change.

SECTION-D

Sociology of Underprivileged: Women, Scheduled Castes, Scheduled Tribes, Disabled, Minorities. Gender inequality, Aging, Racial and Ethnic Inequality.

MA (Education)

Section A

1. Co-operative nature
2. Wide interest and Scholarly taste
3. Moral character & discipline
4. Leadership quality
5. Empathy with the needs of problems of children

Section B-Indian Society

1. Social process: social stratification, social change, social mobility
2. Society and culture: cultural change, cultural lag, acculturation
3. Social problem: Social injustice and inequality, poverty, crime against women, child labour, drug abuse

Contemporary Indian education system

1. Education in independent India: Provisions for education in Indian constitution, Structure of Indian education system: from Primary to higher education
2. Efforts for free and compulsory education: from Sarva Shiksha Abhiyan to Right to Education

Section C-Human development and learning

1. Thinking, Reasoning and problem
2. Learning processes
3. Human development

Section D

1. Caste and Class: The Education of marginalized
2. Gender: The Girl Child and Schooling
3. Education of/for minorities
4. Language, Politics and Culture: Mainstream and alternatives
