AIIMS Entrance Examination Syllabus

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Overview

The AIIMS Entrance Examination is a national-level competitive exam designed to assess candidates' knowledge and aptitude for medical education. The exam tests candidates on fundamental concepts from Physics, Chemistry, and Biology based on the Class 11 and Class 12 NCERT curriculum.

Exam Pattern

Parameter	Details
Exam Mode	Computer-Based Test (CBT)
Duration	3 hours (180 minutes)
Total Questions	200 MCQs
Total Marks	720
Marking Scheme	+4 for correct, -1 for incorrect
Subjects	Physics, Chemistry, Biology

PHYSICS SYLLABUS

Class XI Topics

Mechanics

- Measurement: Units and dimensions, Significant figures, Errors in measurement
- Motion in One Dimension: Kinematics, Equations of motion, Graphs of motion
- Motion in Two Dimensions: Projectile motion, Circular motion
- Laws of Motion: Newton's laws, Friction, Normal force
- Work, Energy, and Power: Work-energy theorem, Conservative forces, Kinetic and potential energy
- Rotational Motion: Angular displacement, Torque, Moment of inertia, Angular momentum

Thermodynamics

- Thermal Properties of Matter: Temperature, Heat, Specific heat capacity, Latent heat
- Thermodynamics: Laws of thermodynamics, Internal energy, Heat and work
- Kinetic Theory of Gases: Molecular nature of matter, Kinetic energy and temperature

Oscillations and Waves

- Simple Harmonic Motion: Equation of SHM, Energy conservation
- Wave Motion: Types of waves, Equation of wave, Speed of wave, Interference

Fluids

- Properties of Bulk Matter: Elasticity, Surface tension, Viscosity
- Fluid Statics: Pressure, Pascal's law, Buoyancy, Archimedes' principle
- Fluid Dynamics: Continuity equation, Bernoulli's theorem

Class XII Topics

Electrostatics

- Electric Charges and Fields: Coulomb's law, Electric field, Electric potential
- Conductors and Insulators: Distribution of charge, Gauss's law
- Capacitance: Parallel plate capacitor, Energy stored, Capacitors in combination

Current Electricity

- Electric Current: Ohm's law, Resistance, Resistivity, Temperature dependence
- EMF and Internal Resistance: Cells, Batteries, Kirchhoff's laws
- Heating Effects of Current: Joule heating, Power dissipation

Magnetism

- Magnetic Field and Magnetic Force: Lorentz force, Motion of charged particles
- Magnetic Field Due to Current: Ampere's law, Biot-Savart law
- Electromagnetic Induction: Faraday's law, Lenz's law, Induced EMF
- Alternating Current: AC circuits, Impedance, Power factor

Electromagnetic Waves and Optics

- Electromagnetic Waves: Maxwell's equations, Nature of EM waves
- Ray Optics: Laws of reflection and refraction, Lenses, Prisms, Optical instruments
- Wave Optics: Interference, Diffraction, Polarization
- Photometry: Luminous intensity, Illumination

Modern Physics

- Atomic Physics: Bohr's model, Quantization of energy, X-rays
- Nuclear Physics: Nuclear structure, Radioactivity, Binding energy, Fission and fusion
- Dual Nature of Matter and Radiation: Photoelectric effect, De Broglie waves, Uncertainty principle
- Semiconductor Electronics: Band theory, Diodes, Transistors

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CHEMISTRY SYLLABUS

Class XI Topics

Physical Chemistry

- Atomic Structure: Bohr's model, Quantum numbers, Electronic configuration
- Chemical Bonding: Ionic bonding, Covalent bonding, Metallic bonding, Coordinate bonding
- Molecular Structure: VSEPR theory, Hybridization, Geometry of molecules
- Thermodynamics: Heat, Work, Internal energy, Enthalpy, Entropy, Gibbs free energy
- Equilibrium: Chemical equilibrium, Equilibrium constant, Le Chatelier's principle

Inorganic Chemistry

- Classification of Elements: Periodic table, Periodicity of properties
- Hydrogen: Properties, Compounds, Uses
- s-Block Elements: Alkali metals, Alkaline earth metals, Properties and compounds
- p-Block Elements: Boron group, Carbon group, Nitrogen group, Oxygen group, Halogens, Noble gases

Organic Chemistry

- Basic Principles: Nomenclature, Types of reactions, Mechanism of organic reactions
- Hydrocarbons: Alkanes, Alkenes, Alkynes, Aromatic compounds
- Organic Compounds Containing Oxygen: Alcohols, Phenols, Ethers, Aldehydes, Ketones, Carboxylic acids
- Organic Compounds Containing Nitrogen: Amines, Amides, Diazonium compounds

Class XII Topics

Physical Chemistry

- Kinetics: Rate of reaction, Order and molecularity, Rate constant, Activation energy
- Electrochemistry: Redox reactions, Electrochemical cells, Faraday's law, Corrosion
- Surface Chemistry: Adsorption, Catalysis, Colloids, Emulsions
- Solutions: Concentration terms, Colligative properties, Solubility

Inorganic Chemistry

- d-Block Elements: Transition metals, Electronic configuration, Oxidation states, Complex compounds
- Coordination Compounds: Nomenclature, Bonding, Crystal field theory, Color
- General Principles of Isolation: Concentration of ore, Extraction, Refining
- f-Block Elements: Lanthanides, Actinides

Organic Chemistry

- Aldehydes and Ketones: Preparation, Properties, Reactions
- Carboxylic Acids and Derivatives: Preparation, Properties, Esters, Acid halides, Amides
- Amines: Preparation, Properties, Reactions
- Polymers: Types, Preparation, Applications
- Biomolecules: Carbohydrates, Proteins, Nucleic acids, Enzymes

BIOLOGY SYLLABUS

Class XI Topics

Diversity of Living Organisms

- Five Kingdom Classification: Monera, Protista, Fungi, Plantae, Animalia
- Plant Classification: Algae, Bryophytes, Pteridophytes, Gymnosperms, Angiosperms
- Animal Classification: Phylum Porifera through Phylum Chordata

Cell and its Structures

- Cell Theory: Discovery, Prokaryotic and eukaryotic cells
- Cell Organelles: Functions of nucleus, mitochondria, chloroplast, endoplasmic reticulum, Golgi apparatus, lysosomes, centrosome
- Cell Membrane: Structure, Selectively permeable nature, Transport mechanisms

Plant Physiology

- Photosynthesis: Light-dependent and light-independent reactions, Chloroplast structure
- Respiration: Aerobic and anaerobic respiration, ATP production
- Transpiration and Transport: Xylem and phloem transport, Plant growth and development

Animal Physiology (Overview)

- Nutrition: Types, Digestive system
- Respiration: Types, Respiratory system
- Circulation: Blood, Heart, Circulatory system
- Excretion: Kidney, Osmoregulation

Reproduction and Development

- Sexual and Asexual Reproduction: Modes of reproduction
- Gametogenesis: Spermatogenesis, Oogenesis
- Fertilization and Development: Early embryonic development

Class XII Topics

Genetics and Evolution

- Mendelian Inheritance: Monohybrid cross, Dihybrid cross, Laws of inheritance
- Molecular Basis of Inheritance: DNA, RNA, Genetic code, Protein synthesis
- Gene Expression and Regulation: Transcription, Translation, Gene regulation
- Evolution: Theories of evolution, Evidence for evolution, Speciation

Ecology and Environment

- Organisms and Environment: Biotic and abiotic factors, Habitat, Niche
- Population Ecology: Population growth, Carrying capacity, Density-dependent and independent factors
- Community Ecology: Ecological succession, Interaction between species
- Ecosystem: Energy flow, Biogeochemical cycles, Ecosystem dynamics

- Biodiversity and Conservation: Biodiversity at global and species level, Conservation strategies
- Environmental Issues: Pollution, Climate change, Sustainable development

Human Physiology (Detailed)

- Digestion and Absorption: Structure of digestive system, Enzyme action, Nutrient absorption
- Respiration and Gas Exchange: Respiratory system, Mechanics of breathing, Gas transport
- Circulation: Heart structure and function, Blood composition, Blood circulation, Regulation of heartbeat
- Excretion: Kidney structure and function, Urine formation, Osmoregulation, Regulation of body fluid
- Nervous System: Neuron structure, Neural impulse transmission, Brain and spinal cord, Reflex arc, Sense organs
- Endocrine System: Hormones, Hormone action, Major glands and their hormones
- Immune System: Immunity types, Immune response, Lymphatic system
- Muscular and Skeletal System: Muscle types, Muscle contraction, Skeletal structure and joints
- Homeostasis: Regulation of body temperature, Blood pressure regulation, Blood glucose regulation

Reproduction and Development

- Male and Female Reproductive Systems: Structure and function
- Menstrual Cycle: Phases, Hormonal changes
- Gametogenesis: Spermatogenesis and oogenesis
- Fertilization: Sperm capacitation, Acrosome reaction
- Early Embryonic Development: Cleavage, Blastocyst formation, Implantation, Gastrulation
- Later Development: Organogenesis, Differentiation, Growth

Biotechnology and Its Applications

- Genetic Engineering: Recombinant DNA technology, Transgenic organisms
- Bioinformatics: DNA sequencing, Genome mapping
- Applications of Biotechnology: Agriculture, Medicine, Industry
- Ethical Issues: GMOs, Gene therapy, Patent issues

Important Tips for AIIMS Preparation

Subject-wise Strategy

Physics (180 marks)

- Focus on conceptual clarity over rote learning
- Practice numerical problems regularly
- Understand the derivations, not just formulas
- Connect concepts with real-world applications

Chemistry (180 marks)

- Master the periodic table and element properties
- Practice chemical equations and balancing
- Organic chemistry requires systematic approach
- Physical chemistry requires regular problem-solving

Biology (360 marks)

- Biology has maximum weightage - allocate 50% preparation time
- Focus on diagrams and labeling
- Understand physiological processes thoroughly
- Learn taxonomy and classification systematically

General Preparation Guidelines

1. **NCERT Books:** Use NCERT Class 11 and 12 textbooks as the primary source
2. **Practice Tests:** Solve mock papers and previous year questions regularly
3. **Time Management:** Develop speed and accuracy through timed practice
4. **Revision:** Regular revision of all topics is crucial
5. **Balanced Approach:** Don't neglect any topic; maintain balance across all subjects
6. **Health and Wellness:** Maintain proper sleep schedule and healthy diet

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Subject-wise Reference

Subject	Key Topics	Weightage
Physics	Mechanics, Thermodynamics, Electricity, Magnetism, Optics, Modern Physics	25%
Chemistry	Organic, Inorganic, Physical Chemistry	25%
Biology	Cell Biology, Genetics, Human Physiology, Ecology, Biotechnology	50%

Frequently Asked Questions

Q: How long should I prepare for AIIMS?
A: Typically 6-12 months of dedicated preparation is recommended, though it varies by individual background.

Q: Is NCERT sufficient for AIIMS?
A: NCERT is the foundation; supplement with other quality resources for deeper understanding and practice.

Q: What is the difficulty level of AIIMS?
A: AIIMS is considered one of the most challenging medical entrance exams in India, requiring strong conceptual understanding.

Q: Are short notes helpful?
A: Yes, but only after thorough study. Short notes are excellent for final revision.

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