



MMM COLLEGE OF  
HEALTH SCIENCES

**UG ADMISSION  
SYLLABUS FOR  
ENTRANCE  
EXAMINATION –  
2022  
(CBSE &  
STATE BOARD)**

## **PHYSICS SYLLABUS FOR THE ENTRANCE EXAMINATION – JULY 2022**

### **1. CURRENT ELECTRICITY:**

- Electric current.
- Ohm's law.
- Resistance in series and parallel, Color code for carbon resistors.
- Temperature dependence of resistance.
- Potential difference and EMF of a cell.
- Combination of cells in series and in a parallel.
- Kirchhoff's laws.
- Wheatstone bridge.
- Meter bridge.
- Potentiometer.
- Electrical energy and power.

### **2. EFFECTS OF CURRENT AND MAGNETISM:**

- Magnetic effects of current.
- Biot – Savart law.
- Ampere's law.
- Force on a moving charge in uniform magnetic and electric fields.
- Force on a current – carrying conductor in a uniform magnetic field.
- Torque experienced by a current loop.
- Moving coil galvanometer – its current sensitivity and conversion to ammeter and voltmeter.
- Magnetic dipole.
- Earth's magnetic field and magnetic elements.
- Electromagnetic induction and altering currents.

### **3. ELECTROMAGNETIC WAVES:**

- Electromagnetic waves – Characteristics, Transverse nature.
- Electromagnetic spectrum – Radio waves, Microwaves, Infrared, Visible ultraviolet X – rays, Gamma rays.

### **4. OPTICS:**

- Refraction of light.
- Total internal reflection and its applications.
- Optical fibres.
- Refraction at spherical surfaces.

- Lensmaker's formula.
- Magnification.
- Power of a lens.
- Refraction of light through a prism.
- Optical instruments – Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.
- Wave front and Huygen's principle.
- Reflection and refraction of plane wave at a plane surface using wave fronts.
- Young's double slit experiment and expression for fringe width.
- Diffraction due to a single slit, width of central maximum.

### **5. ATOMS AND NUCLEI:**

- Alpha – particle scattering experiment.
- Rutherford's model of atom.
- Bohr model, Energy levels, hydrogen spectrum.
- Composition and size of nuclei.
- Mass – Energy relation, mass defect, nuclear fission and nuclear fusion.

### **6. ELECTRONIC DEVICES:**

- Semiconductors and insulators.
- Energy bands in conductors.
- Diode as a rectifier.
- Special purpose p – n junction diodes.
- LED.
- Photodiode.
- Solar cell.

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## **CHEMISTRY SYLLABUS FOR THE ENTRANCE EXAMINATION – JULY 2022**

### **1. CHEMICAL KINETICS:**

- Rate of reaction (Average and instantaneous)
- Factors affecting rate of reaction
- Order and molecularity of a reaction.
- Integrated rate equations and half - life (Only zero and first order reactions)

### **2. COORDINATION COMPOUNDS:**

- Definition
- Central metal atom/ ion, Ligands, coordination number, magnetic properties and shapes.
- Nomenclature of coordination compounds.
- Theories of co-ordination compounds: Werner's theory, Valence Bond Theory, Crystal field theory; Stability and applications of co-ordination compounds.

### **3. ELECTROCHEMISTRY:**

- Standard electrode potential.
- Nernst equation and its application to chemical cells.
- Relation between Gibbs energy change and EMF of a cell.
- Conductance in electrolytic solutions.
- Specific and molar conductivity.
- Variations of conductivity with concentration.
- Kohlrausch's Law.

### **4. SURFACE CHEMISTRY:**

- Types of adsorption.
- Factors affecting adsorption of gases on solids.
- Colloidal state – Classification, Preparation and purification of colloids, Properties of colloids.

### **5. BIOMOLECULES:**

- Carbohydrates – Classification, monosaccharides and disaccharides configuration.
- Protein – Classification, Structures of protein and denaturation of protein.
- Nucleic acids – DNA & RNA.

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## **BIOLOGY SYLLABUS FOR THE ENTRANCE EXAMINATION – JULY 2022**

### **1. Human reproduction and reproductive health:**

- Male and female reproductive systems;
- Microscopic anatomy of testis and ovary;
- Gametogenesis - spermatogenesis and oogenesis;
- Menstrual cycle;
- Fertilisation,
- Embryo development up to blastocyst formation,
- Implantation;
- Pregnancy and placenta formation.

Need for reproductive health and prevention of Sexually Transmitted Diseases (STDs)

### **2. Molecular genetics:**

- Search for genetic material and DNA as genetic material;
- Structure of DNA and RNA;
- DNA packaging;
- DNA replication;
- Central Dogma;
- Transcription,
- Genetic code,
- Translation;
- Gene expression and regulation - lac operon;
- Genome,
- Human and rice genome projects;
- DNA fingerprinting.

### **3. Human Health and diseases:**

- Pathogens;
- Parasites causing human diseases (malaria, dengue, chikungunya, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm) and their control;
- Basic concepts of immunology - vaccines;
- Cancer,
- HIV and AIDS;
- Adolescence - drug and alcohol abuse.

#### **4. Biology and human welfare:**

- Microbes in food processing,
- Industrial production,
- Sewage treatment,
- Energy generation and bioremediation.
- Microbes as bio-control agents and bio-fertilizers. Antibiotics - production and judicious use.

#### **5. Biodiversity and its Conservation:**

- Biodiversity - Concept, patterns, importance.
- Importance of biodiversity - Global and India.
- Causes of biodiversity loss,
- Conservation of biodiversity - hotspots,
- Endangered organisms,
- Extinction,
- Red Data Book,
- Sacred Groves, biosphere reserves, national parks, wildlife, sanctuaries and Ramsar sites.

#### **6. Ecology and Environment:**

- Organisms and environment: Habitat and niche, population and ecological adaptations;
- Population interactions - mutualism, competition, predation, parasitism;
- Population attributes - growth, birth rate and death rate, age distribution.

#### **7. Biotechnology and its Applications:**

- Application of biotechnology in health and agriculture: Human insulin and vaccine production, stem cell technology, gene therapy.
- Genetically modified organisms - Bt crops; transgenic animals;
- Biosafety issues.

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