

**SYLLABUS FOR PRELIMINARY EXAMINATION FOR RECRUITMENT TO THE POSTS OF ASSISTANT MASTER/MISTRESS IN BENGALI**

Full Marks : 100

Time : 1 Hour 30 Minutes

১. পাঠ্য বই :

- ক) উপন্যাস : কৃষ্ণকামচন্দ্র উইল - বঙ্কিমচন্দ্র চট্টোপাধ্যায়;  
 আর্যসিক - তিভুতিভুজ্ঞা চন্দ্রোপাধ্যায়;  
 বনময়সঙ্গ - আকস্মিক দেবী;
- খ) কাব্য : \* ভোজনাদি পঠি কাব্য - জাহ্নবীকান্ত মুখোপাধ্যায় দত্ত;  
 চতুর্থ, ঈষৎ, নবম অঙ্ক।
- \* দ্বিবনময় দাস : বনময় ভোজন কাব্যগ্রন্থ :  
 - প্রথম পঁচটি কবিতা;
- \* সুদাস মুখোপাধ্যায় - পদচক্র কাব্যগ্রন্থ :  
 - প্রথম পঁচটি কবিতা;
- \* কাজী নজরুল ইসলাম - চিত্রোছবি, অসম্ভব কল্পিত;
- গ) নাটক : \* বিদ্রোহ : বসন্তকান্ত চক্রবর্তী;  
 \* নবক গুণাকার : মনোরম কবিতা;
- ঘ) পুস্তক : \* নিরুপস্থিত পুস্তক : কাজী আব্দুল ওহাদ :  
 প্রথম পঁচটি পুস্তক;  
 \* জ্যোতি পুস্তক : আব্দুলকাদের রায় :  
 প্রথম পঁচটি পুস্তক
- ঙ) চরিত্রগল্প - বসন্তকান্ত চক্রবর্তী → লেখক বসন্তকান্ত চক্রবর্তী;  
 বঙ্কিমচন্দ্র চট্টোপাধ্যায় → অশ্রুত;  
 জনক চন্দ্রোপাধ্যায় → চিত্রিত;  
 জৈনদ মুখোপাধ্যায় জিতেন্দ্র → গল্পের চরিত্র;  
 জ্যোতিষ্মদী নন্দী → জিতেন্দ্র;

২. প্রাচীন সাহিত্যের ইতিহাস -

- \* ঠাকুরকাব্য - (কামাকান্ত, চন্দ্রিকান্ত, বসন্তকান্ত)
- \* বিষ্ণুকাব্য - (বিদ্যাপতি, চন্দ্রিকা, জগদানন্দ, গোবিন্দদাস)
- \* লেখক উল্লিখিত কলেব, বিদ্যাপতির, দীপক, গিরিজা ভোষ, চিত্রেন্দ্রনাথ রায়, প্রথম চৌধুরী, সত্যেন্দ্রনাথ দত্ত;

୭. ପ୍ରାୟୋଗିକ ପ୍ରକାରଣ:

\* ଅଗ୍ନି, ଅକ୍ଷୟ, ମୃତ୍ୟୁ, କାରକ ଓ ବିଭବିତ, ମନ-ପରିଚ୍ଛେଦ, ମନିଷ୍ୟ ପରିଚ୍ଛେଦ, ଅଧ୍ୟାତ୍ମିକ-ଅଧ୍ୟାତ୍ମିକ, ଏକ କଲ୍ୟାଣ ମୁକ୍ତାକା;

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**SYLLABUS FOR PRELIMINARY EXAMINATION FOR RECRUITMENT TO THE POSTS OF  
ASSISTANT MASTER/MISTRESS IN ENGLISH**

**Full Marks : 100**

**Time : 1 Hour 30 Minutes**

1. A knowledge of the history of English Literature from 1340 to 2000.
2. A close acquaintance with the following works which are prescribed for detailed study :-

a)	William Shakespeare	:	Macbeth, As you Like It
b)	Jane Austen	:	Pride and Prejudice
c)	John Milton	:	Paradise Lost (Book I)
d)	Alexander Pope	:	The Rape of the Lock
e)	R. K. Narayan	:	The Guide
f)	Amitav Ghosh	:	The Shadow Lines
g)	P. B. Shelley	:	Ode to the West Wind
h)	John Keats	:	Ode to a Nightingale
i)	Alfred Tennyson	:	Ulysses
j)	Robert Browning	:	My Last Duchess
k)	T. S. Eliot	:	Preludes

3. Grammar
4. Vocabulary  
Antonym, Synonym, Idiomatic usage of  
Language, Figures of Speech etc.
5. Test of Comprehension

(Candidates will be given a passage of 250 to 300 words. They should read it carefully and answer the questions. The answers may be contained in the passage or may be inferred from the reading of the passage).

**SYLLABUS FOR PRELIMINARY EXAMINATION FOR RECRUITMENT TO THE POSTS OF  
ASSISTANT MASTER/MISTRESS IN SANSKRIT**

**Questions will be set in Sanskrit language**

**Full Marks : 100**

**Time : 1 Hour 30 Minutes**

1. **Sanskrit Texts (general acquaintance only)**
  - A) Sammanasyasuktam(Rgveda 10/191 )
  - B) Taittirya Upanisad(Siksavalli 1/11-12 )
  - C) Abhijñanasakuntālam
  - D) Kumarasambhavam(Canto I)
  - E) Varsavarnanam(Kiskindhyakandam)
  - F) Srimadbhagavadgita (11th Adhyaya)
  - G) Dasakumaracaritam(Rajavahanacaritam)
2. **Alamkara and Chanda**
  - A) Sahityadarpanam.(10th Chapter)  
Upto Vibhavana and Visesokti
  - B) Chanda (Samavrtta only) naming the metre
3. **History of Sanskrit Literature**
  - A) Vedic Literature – Samhita, Brahmana, Aranyaka, Upanisad, Vedanga
  - B) Classical Literature- Ramayana, Mahabharata, Asvaghosa, Bhasa, Kalidasa Bharavi, Bhatti, Kumaradasa, Magha, SriHarsa, Sudraka, Visakhadatta, Bhattanarayana, Bhavabhuti, Harsa, Dandi, Bana, Fables (Pancatantra, Hitopadesa), Historical Kavya, Lyrical Kavya
4. **Elementary Sanskrit Grammar**

Sandhi, Karaka, Samasa, Krt Prayaya, Taddhita Pratyaya, Atmanepada-Parasmaipada Vidhana
5. **Comprehension (of 250 to 300 words)**

(Candidates will be given a passage of 250 to 300 words. They should read it carefully and answer the questions. The answer may be contained in the passage or may be inferred from the reading of the passage.)

**SYLLABUS FOR PRELIMINARY EXAMINATION FOR RECRUITMENT TO THE  
POST OF ASSISTANT MASTER / MISTRESS IN GEOGRAPHY**

**Full Marks : 100**

**Time : 1 Hour 30 Minutes**

**S E C T I O N - I**

**A. PHYSICAL GEOGRAPHY**

1. Origin of Continents and Ocean Basins; Continental Drifts and Plate Tectonics; Epirogenic and Orogenic movements; Different kinds of Landforms and their origin; Volcanoes and Volcanic features; Earthquakes.
2. Earth's Crust - general properties; Modes and origin of igneous, sedimentary and metamorphic rocks.
3. Weathering and Mass wasting.
4. Evolution of Landforms under different Cycles of Erosion - fluvial, glacial, Aeolian, marine and karst; Evolution of drainage system and its adjustment to structure.
5. Elements and factors of climate; Distribution of temperature and pressure belts over the Earth.
6. Airmass, Planetary Winds and Local Winds.
7. Precipitation - origin and types; Cyclones and Anti-Cyclones.
8. Classification of World Climates.

**B. ENVIRONMENTAL GEOGRAPHY**

9. Concepts of Environment, Ecology and Ecosystem; Natural and Man-made Ecosystems; Concepts of Bio-Diversity; Environmental Pollution, Degradation and Conservation; greenhouse effects and global Warming; Man-Environment relationships.

**S E C T I O N - II**

**C. ECONOMIC GEOGRAPHY**

10. Geographical factors favourable for the localization of the following major economic activities :
  - a) Lumbering,
  - b) Agriculture (Intensive Subsistence farming, Extensive Commercial farming and Plantation agriculture),
  - c) Fishing,
  - d) Mining (Coal, Petroleum and Iron ore - their distribution and utilization),
  - e) Power resources (conventional and Non-conventional),
  - f) Manufacturing (Iron & Steel, Aluminium, Cotton Textile and Jute industries).

**D. HUMAN GEOGRAPHY**

11. Concepts of Geographical Environment, Natural Regions of the Earth; - their characteristics; Role of Climate, Drainage and Relief in localizing human activities with particular reference to food gathering, pastoralism and subsistence agriculture.
12. Settlement Patters - Rural and Urban; Hierarchy of Urban Settlements; Growth and distribution of World Population.

**E. GEOGRAPHY OF INDIA**

13. Structure, Relief, Drainage, Climate, Soils and Natural Vegetation.
  14. Irrigation and River Valley Projects; Agriculture and Green Revolution.
  15. Mineral Resources and industrial Regions.
  16. Population - growth and distribution, age-sex composition, migration, urbanization and regional disparities.
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**SYLLABUS FOR PRELIMINARY EXAMINATION FOR RECRUITMENT TO  
THE POSTS OF ASSISTANT MASTER/ MISTRESS IN HISTORY**

**Full Marks : 100**

**Time : 1 Hour 30 Minutes**

**G R O U P - A**

**ANCIENT HISTORY**

1. Ancient India (From rise of Magadhan imperialism to Harshavardhan).
2. Ancient China (Economic, Social and Cultural achievements under Tang & Sung Emperors).
3. Ancient Egypt (An outline of ancient Egypt with special reference to Pyramids, Mummies, Scripts, Trade & Commerce).
4. Ancient Greece (Cultural achievement under the Athenian Empire & Spartan constitution).
5. Ancient Rome (A general survey of ancient roman empire-building, Roman Law & System of Government).

**G R O U P - B**

**MEDIEVAL HISTORY**

1. Medieval Europe (Feudalism, Charlemagne, Empire vs Papacy & Crusades).
2. Medieval India (1206-1707 AD).

**G R O U P - C**

**MODERN INDIA (1757-1947)**

**G R O U P - D**

**MODERN EUROPE & WORLD (1789-1945)**

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**SYLLABUS FOR PRELIMINARY EXAMINATION FOR RECRUITMENT TO THE  
POSTS OF ASSISTANT MASTER/ASSISTANT MISTRESS IN LIFE SCIENCE**

**SUBJECT : BOTANY**

**Full Marks : 100**

**Time : 1 Hour 30 Minutes**

**Module – 1 : The Gateway of Life Sciences :**

1. The science of Life - Definition of Life; Origin and Evolution of Life on the Earth (overview).
2. Basic Technology associated with the study of Botany - Concept of simple, compound and electron microscopy; cell fractionation and centrifugation; colorimetry; tracer techniques.
3. Cell Structure and Function - Differences between prokaryotic and eukaryotic cells; ultra structural components and functions of the cell wall, plasma membrane, nucleus, mitochondria, plastids, endoplasmic reticulum, Golgi bodies, ribosomes, lysosomes and peroxisomes.

**Module – 2 : Cell Biology and Genetics :**

1. Morphology of chromosome; autosomes and sex chromosomes; differences between euchromatin and heterochromatin; basic methods of chromosome study; concept of gene; physical structure and chemical properties of nucleic acids (DNA and RNA).
2. Cell cycle; cell division (mitosis and meiosis) in plants.
3. Mendel's laws and experiments of heredity; linkage and crossing over; concept of mutation and mutagens; polyploidy.

**Module – 3 : pH, Buffer, Water and Biomolecules :**

1. Concept of pH; pH scale; Justification for pH value (7.0) of pure water; concept of buffer.
2. Diversification in structures of different carbohydrates (monosaccharides, disaccharides and polysaccharides); differences between reducing and non-reducing sugars.
3. Concept of structural, functional aspects and basic classification of proteins and lipids; types and classification of vitamins.

**Module – 4 : Plant Physiology :**

1. Concept of cell physiology - imbibition, diffusion, osmosis and plasmolysis; ascent of sap; translocation of solutes; types of transpiration and mechanism of stomatal transpiration; types of micro and macro elements required by plants.
2. Phases and factors of plant growth; precursor(s), structure and physiological roles of auxins, gibberellins, cytokinins, ethylene and abscisic acid.
3. Concept of photoperiodism and vernalization; physical and chemical nature of phytochrome; mechanism of seed dormancy and germination.

**Module – 5 : Biochemistry :**

1. Enzymes – Definition; basic architecture (holoenzyme, apoenzyme, coenzyme, cofactor); properties; nomenclature and classification (6 major classes with examples indicating name and reaction at least one for each class) according to IUBMB; concept of enzyme action.
2. Respiration - Definition; differences between aerobic & anaerobic respiration; metabolic pathways (by means of schematic presentation only) of glycolysis, oxidative decarboxylation of pyruvic acid, TCA cycle; concept of electron Transport System & Oxidative Phosphorylation; concept of RQ.
3. Photosynthesis - Definition; major photosynthetic pigments; concept of the spectrum of visible light; Hill reaction; concept of light-dependent & light-independent phases; Z-scheme of light reaction; biosynthetic reactions (by means of schematic presentation only) of CO<sub>2</sub> - fixation in C<sub>2</sub>, C<sub>3</sub> and C<sub>4</sub> cycles/pathways.

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# **SUBJECT : BOTANY**

## **Module – 6 : Molecular Biology and Plant Biochnology :**

1. Gene structure and function; genetic code; concept of DNA replication; concept of protein synthesis (outlines only).
2. Outlines of recombinant DNA technology (preliminary concept of vectors, plasmid, restriction enzymes, DNA and CDNA libraries, nucleic acid sequencing and PCR).
3. Definition and agricultural application of Plant Biotechnology; outlines of Plant tissue culture and its applicationsl concept of totipotency; basic concept and objectives of cloning and transgenic plants.

## **Module – 7 : Microbiology :**

1. Concept of microbial world; structure of a typical phage virus; structure of a bacterial cell.
2. Basic types of bacterial on the basis of morphological features; concept and difference between Gram-positive and Gram-negative bacteria; reproduction of bacteria.
3. Concept of nitrogen-fixing bacteria; concept of pathogenic bacteria; concept of antibiotics.

## **Module – 8 : Plant morphology and Anatomy :**

1. Root-Morphology and functions of tap and adventitious roots; different modified roots; Stems-Morphology and functions of stem different modified stems; Leaf-morphology and functions of leave phyllotaxy, stipule, modified leaves.
2. Flower – Different parts of a typical flower, flower as a modified shoot, principal types of inflorescences, types of lower (regular irregular, actinomorphic and zygomorphic), morphology and androecium and gynoecium; Fruit – definitions and types; basic morphology of seed.
3. Plant Anatomy - Concept and types of meristematic and permanent tissues; epidermal, ground and vascular tissue systems; types of stele; primary anatomical structures of root (monocot and dicot), stem (monocot and dicot) and leaf (dorsiventral and isobilateral).

## **Module – 9 : Plant Taxonomy :**

1. Taxonomy - Definition, importance, relations of taxonomy with classification of plant groups.
2. Rules of Binomial nomenclature; basic types of classification (artificial, natural and phylogenetic).
3. Classification of plant kingdom; salient features of different plant groups (algae, fungi, bryophyte, pteridophyta, gymnosperms and angiosperms).

## **Module – 10 : Plant groups :**

1. Life cycle pattern with special reference to alteration of generations in thallophyta (algae and fungi) and Bryophyta.
2. Life cycle pattern with special reference to alternation of generations in Pteridophyta and Gymnosperms.
3. Morphological description pattern of any angiospermic plant for its taxonomic identification; economically important angiosperms - bamboo, jute, lemon and tea.

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# **SUBJECT : ZOOLOGY**

**Full Marks : 100**

**Time : 1 Hour 30 Minutes**

## **Section – I :**

1. Classification of Protozoa up to Phyla.
2. Structural organization and reproduction in Paramecium.
3. Classification upto subclass ; Porifera to Echinoderm.
4. Coral reef : Types and formation.
5. Locomotion in Protozoa.
6. Canal system in Porifera.
7. Nervous system in Mollusca
8. Respiration in Arthropoda.
9. Affinities in Onychophora, Balanoglossus.
10. Classification of Chordata upto order.
11. Structural organization of Lates.
12. Axolotl Larva and its importance.
13. Difference between poisonous and non-poisonous snakes.
14. Migration of birds.
15. Dentition in mammals.
16. Comparative anatomy of Heart, Aortic arches, and Kidney in Vertebrates.

## **Section – II :**

1. Principles of optical and electron microscopes.
2. Ultra structure and functions of Plasma membrane, Mitochondria, golgi complex, Endoplasmic reticulum and Lysosome.
3. Physico-chemical properties of DNA and RNA, Nucleosome concept.
4. Sex determination in Drosophila and Man.
5. Replication, Transcription and Translation.
6. 3-point gene mapping in diploid.
7. Inborn metabolic errors : Albinism, Haemophilia, thalassaemia.
8. Gametogenesis.
9. Fertilization.
10. Histological organization of Pituitary, Thyroid, Pancreas and Liver.

**SUBJECT : ZOOLOGY**

**Section – III :**

1. Geological time scale.
2. Origin of life.
3. Origin and Evolution of Horse.
4. Theories of Evolution : Darwinism & Neo Darwinism.
5. Hardy-Weinberg principles (application in autosomal alleles).

**Section – IV :**

1. Taxonomy, Systematics and classification.
2. Mode of speciation.
3. Biological species concept.
4. Concept of Energy flow, Food chain and food Web.
5. Ecological succession.
6. Concept of biodiversity : Types of biodiversity, biodiversity and human welfare.
7. Life cycle, Pathogenicity, clinical features and control of : Taenia, Ascaris, Plasmodium, Leishmania and Wuchereria bancrofti.

**Section –V :**

1. Structure of mammalian nephron and mechanism of Urine formation.
2. Propagation of nerve impulse.
3. Transport of CO<sub>2</sub> and O<sub>2</sub> in mammals.
4. Structure of eye and mechanism of vision in mammals. Structure of ear and mechanism of hearing in mammals.
5. Aquaculture : Induced breeding in carp culture. Fresh water and brackish water prawn culture, Pearl culture.
6. Sericulture : Mulberry silk worm culture; diseases of silk worm and their control.
7. Apiculture : Apiculture technique; diseases of honey bees and their control.

**SUBJECT : PHYSIOLOGY**

**Full Marks : 100**

**Time : 1 Hour 30 Minutes**

1. Units of Human Systems : Structure – function relationship of cell and tissues.
  2. Basic Biophysical Principles : pH, Osmosis, buffers, Gibb's Donnan equilibrium, electrophoresis.
  3. Conservation of matter and energy in human systems : Digestion, Elementary Biochemistry and metabolism, vitamins and minerals principles of nutrition, nutritional deficiencies, nutrition and health, enzymes and isozymes, inborn errors of metabolism.
  4. Blood and Body fluids : Functions of blood, Hemoglobin, Plasma proteins, Erythropoiesis, Coagulation of blood, Blood-groups, Blood transfusion - rational use and transfusion related diseases. Basic principles of immunology - auto immune diseases.
  5. Heart & Circulation : Structure & functions of heart, properties of cardiac muscle, origin & spread of cardiac impulse, Cardiac cycle, Cardiac output - regulation & determination, innervation of heart, reflexes, regulation of circulation, Electrocardiography, Non invasive cardiac assessments.
  6. Respiratory System : Basic physiology, carriage of oxygen & carbon dioxide, Lung volumes & capacities, regulation of respiration, High altitude and under water physiology.
  7. Renal Physiology : Structure & functions of nephron, formation of urine, micturition, non excretory functions of Kidney, dialysis, artificial Kidney.
  8. Nerve-Muscle Physiology : Structure & functions of muscles & nerve, classification of nerve fibres, different types of muscles, neuromuscular junction, N-M transmission, synaptic transmission, origin and propagation of nerve impulse, degeneration and regeneration in nerve fibres.
  9. Nervous System : Gross organization, tracts - ascending and descending, reflex arc, classification of reflex - properties, autonomic nervous system, functions of sympathetic & para-sympathetic system, Higher functions of CNS – sleep, memory, learning.
  10. Sensory physiology : vision - structure and functions - specially of retina, colour vision, accommodation, defects of vision. Olfaction, gustation and audition - noise and its effects.
  11. Skin and Body temperature regulation : Basic physiology.
  12. The Endocrine System : Structure of endocrine glands, Hormone classification, different hormones - their functions : hypothalamus, pituitary, thyroid, parathyroids, pancreas, adrenal cortex and medulla Diseases associated with hypo and hyper secretion of hormones.
  13. Reproductive physiology : Histology of male and female reproductive system, menstrual cycle - hormonal regulation, ovarian and testicular hormones, Pregnancy, Placenta - formation and function, lactation, contraceptives.
  14. Basic principles of Work Physiology & Ergonomics : Static and dynamic work, PFI, doping, role of anthropometry, somatotyping, Role of ergonomics in industry and agriculture. Exercise and Health.
  15. Environmental Physiology : Pollutants and pollution, classification of pollutant according to physiological mechanism of action, Bio-transformation, dose-response curves/relationship, teratogens, mutagens, neurotoxins, corrosive agents, Heavy metal toxicity, Pesticidal Hazards.
  16. Social Physiology : Basic principles, mass immunizations, ORS, Safe drinking water, communicable and non-communicable diseases.
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**SYLLABUS FOR PRELIMINARY EXAMINATION FOR RECRUITMENT TO THE POSTS OF ASSISTANT MASTER/MISTRESS IN MATHEMATICS**

**Full Marks : 100**

**Time : 1 Hour 30 Minutes**

**Algebra :**

Complex Number : De Moivre's theorem, its applications.  
Exponential, Sine, Cosine, Logarithm of a Complex Number.

Theory of Equations : Relation between roots and co-efficients, symmetric function of roots, transformation of equation, multiple root.

Determinant and matrix : Properties and applications.

Inequality :  $AM \geq GM \geq HM$  and its applications.

**Set Theory :**

Basic concepts, mapping, group, ring, field.

**Boolean Algebra :**

Basic concepts. Boolean variables and functions and their truth tables. NOT, OR and AND gates. Binary systems.

**Vector :**

Vector addition, Scalar and vector product. Application of vector algebra in geometrical and trigonometrical problems.

**Calculus :**

Differential Calculus - Sequence, series, Limit, continuity, differentiability, Successive derivatives. Rolle's theorem, Mean value theorem.

Integral Calculus - Indefinite integral, definite integral and its properties, definite integral as limit of sum. Beta and Gamma functions.

**Application of Calculus :**

Tangent & normal, curvature, pedal equation, curve-tracing, area, rectification.

**Differential Equation :**

Linear equation, Clairaut's equation, Complementary function, particular integral of higher order. Linear equations with constant Co-efficient.

**Geometry :**

Translation and rotation of axes. Reduction into Canonical form. Pair of straight lines. Circle, Parabola, ellipse, hyperbola – simple properties.

Equation of straight lines in space, equation of plane.

**Numerical Analysis :**

Errors in numerical computation – gross error, round off, truncation error, significant figure, absolute, relative, percentage error. Operators -  $\Delta \nabla E$

Difference table, Newton's forward and backward interpolation formula.

**Probability :**

Basic concepts, addition and multiplication rule of probabilities. Conditional probability, Bay's theorem.

**Dynamics :**

Motion in a straight line under variable acceleration, motion under inverse square law, motion in resisting medium. Impact of elastic bodies, loss of KE in direct and oblique impact.

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# SYLLABUS FOR PRELIMINARY EXAMINATION FOR RECRUITMENT TO THE POST OF ASSISTANT MASTER/MISTRESS IN PHYSICS

**Full Marks : 100**

**Time : 1 hour 30 minutes**

**1. Classical Mechanics :**

Newton's laws of motion; Mechanics of a single particle; Rotational Motion; Gravitation.

**2. General Properties of matter :**

Elasticity; Surface Tension; Viscosity.

**3. Vibrations and Waves :**

Simple Harmonic Motion; General Wave Equations; Vibrations of Strings.

**4. Heat :**

Kinetic theory of gases; Equations of state; Brownian Motion.

**5. Thermodynamics :**

First and second Laws Entropy, Thermodynamic Functions.

**6. Optics :**

Geometrical Optics; eye pieces; physical optics; Interference; Diffraction, resolving power, polarisation.

**7. Electricity and Magnetism :**

Magnetic effects of currents  
Varying currents  
Alternating currents.

**8. Electronics :**

P – n Junctions, transistors and uses.

**9. Modern Physics :**

Bohr's theory  
Millikan's experiment  
X-rays, Moseleys Laws, Bragg reflection  
Radio-activity, alpha, beta, gamma rays.

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