

## Syllabus for CBT exam to the post of TGT (Medical)

### A. Subjects of B.Sc (Medical)

#### • CHEMISTRY :

(I) **Physical Chemistry**-Atomic and Molecular Structure; States of Matter; Gaseous State; Liquid State; Solid State. Chemical Thermodynamics; Chemical and Phase Equilibria; Solutions and Colligative Properties; Electrochemistry and Electrochemical Cells; Chemical Kinetics and Enzyme Catalysis; Adsorption and Colloidal Solutions; Molecular Spectroscopy.

(II) **Organic Chemistry**- Basic Concepts in Organic Chemistry, Stereochemistry & Conformational Analysis; Organic Reaction Mechanism and its application to synthetic chemistry; Nucleophilic Substitution Reactions; Nucleophilic Addition Reactions; Electrophilic Addition Reactions; Elimination Reactions; Name Reactions and Rearrangements; Qualitative Organic Analysis; Organic Spectroscopy (UV-Visible; IR; NMR); Basics of Natural Products and Biochemistry; Aromatic Nucleophilic and Aromatic Electrophilic Substitution Reactions; Free Radical Reactions; Heterocyclic Chemistry; Polymer chemistry.

(III) **Inorganic Chemistry**- Periodic Table and Periodic Properties; Extractions of Metals and Metallurgy; Structure of Atom; Chemical and Ionic Bonding and Geometry, Shape and Hybridization of Molecules; VSEPR and Molecular Orbital Theory; Main Group Elements (s and p-blocks), Transition Metals (d-block) and Inner-transition Elements (f-block) and their Chemistry. Bioinorganic Chemistry; Nuclear Chemistry; Analytical Chemistry; Coordination Chemistry

#### • BOTANY:

I. **Biodiversity**- Microbes; Algae, Fungi and Archegoniates ( Bryophytes, Pteridophytes and Gymnosperms) .

II. **Plant Ecology and Taxonomy**- Introduction to Ecology; Ecological factors; Biogeochemical cycles; Adaptation of plants to water; Ecological succession; Ecosystem ecology; Phytogeography; Environmental pollution; Biodiversity and wildlife conservation; Introduction to Taxonomy; Principles and rules of ICN; Classification system; Floral diversity.

III. **Plant Anatomy and Embryology**- Tissue system; The shoot system; Leaf; The root system; Embryology of Angiosperms.

IV. **Plant Physiology and Metabolism**- Plants water relations; Mineral nutrition; Photosynthesis; Respiration; Nitrogen metabolism; Basics of Enzymology; Transport of organic solutes; Plants growth regulators; Photomorphogenesis; Seed germination & dormancy; Plants movements.

V. **Economic Botany and Biotechnology**- Cultivated plants; Botanical description & brief idea of cultivation, processing and uses of wheat, maize, rice, potato, cotton, mustard, tea, coffee & sugarcane; Medicinal plants (*Papaver somniferum*, *Rauvolfia serpentina*, *Cinchona succirubra*, *Ocimum sanctum*); Spices and condiments; Introduction to Biotechnology; Biotechnological techniques & Plant biotechnology.

VI. **Cell and Molecular Biology**- Overview and Chemistry of cell; Basic techniques used in Cell Biology; Plasma membrane as Ectomembrane; Endomembrane system of Eukaryotic cell; Chromosomes and cell division; Basic Molecular genetic mechanisms.

**VII. Genetics and Plant Breeding-** Mendelian genetics; Chromosomal alterations/ mutations; Genetic material; Gene expression and regulation; Extra nuclear inheritance; Evolutionary and population genetics; Nature and scope of plant breeding; Methods of crop improvement; Inbreeding depression and heterosis.

- **ZOOLOGY:**

- I. Kingdom Protista – General Characters and classification upto classes.
- II. Phylum Porifera- General Characters and classification upto classes. Canal system in *Sycon*.
- III. Phylum Cnidaria- General Characters and classification upto classes.
- IV. Phylum Platyhelminthes- General Characters and classification upto classes. Life history of *Taenia solium*.
- V. Phylum Nemathelminthes- General Characters and classification upto classes. Life history of *Ascaris lumbricoides* and its parasitic adaptations.
- VI. Phylum Annelids- General Characters and classification upto classes. Life history of *Pheretima posthuma*.
- VII. Phylum Arthropoda- General Characters and classification upto classes. Metamorphosis in insects.
- VIII. Phylum Mollusca- General Characters and classification upto classes. An introduction to the Pearl culture.
- IX. Phylum Echinodermata - General Characters and classification upto classes.
- X. Pisces- Classification upto orders. An introduction to the Indian Major Carps and Trouts.
- XI. Amphibia- General features and classification upto orders.
- XII. Reptilia - General features and classification upto orders. Examples of Poisonous and Non-poisonous snakes. Biting mechanism in snakes.
- XIII. Aves - General features and classification upto orders. Flight adaptation in birds.
- XIV. Mammals- General features and classification upto orders.
- XV. Comparative anatomy of following systems of vertebrates.
- XVI. Integumentary system, Skeletal system, Digestive system, Respiratory system, Circulatory system, Urinogenital system, nervous system, sense organs.
- XVII. Developmental Biology of Mammals- Gametogenesis, Fertilization, cleavage, Implantation, Placentation, Parturition.

XVIII. Structure of neuron, Muscle contraction, origin and propagation of nerve impulse, resting membrane potential.

XIX. Digestion in alimentary canal, Transport of oxygen and carbon dioxide in blood. Structure of nephron, urine formation. Composition of blood, Structure of heart, cardiac cycle, structure of male reproductive system and female reproductive system of human being, menstrual cycle, structure and functions of pituitary gland. Glycolysis, Kreb's cycle, glycogenesis, gluconeogenesis, Transamination, deamination, urea cycle, Introduction to the enzymes and their functions.

XX. Mendel' s work on transmission of traits, Principles of inheritance, sex linked inheritance, pleiotropy, incomplete dominance, linkage crossing over, sex determination, Chromosomal Mutations – duplications ,inversion, deletions, translocation , Lamarckism, Darwinism, Natural selection, Concept and scope of biotechnology, Uses of DNA fingerprinting, introduction to the Southern blotting, Northern blotting and western blotting, concept of tissue culture.

XXI. Parasitism, symbiosis, commensalism, Pathogenecity of *Wuchereria bancrofti*, *Ancylostoma duodenale*, Economic importance of *Helicoverpa armigera*, *Sitophilus oryzae*, *Tribolium castaneum*.

XXII. Medical importance and control of *Anopheles*, *Culex* and *Xenopsylla cheopis*.

XXIII. Preservation and artificial insemination in cattle, poultry farming, induced breeding and transportation of fishes, hill stream fishes and adaptations in hill stream fishes.

XXIV. Freshwater ecosystems (lakes, streams, wetland and rivers).

XXV. Introduction to antigens, antibodies and vaccines, infertility in male, female and diagnosis and management.

XXVI. Diabetes type I and II, Hypertension

XXVII. PET, MRI, CT Scanning in medical diagnostics, Apiculture, sericulture, Life history of mulberry silk moth (*Bombyx mori*) and Lac culture, aquarium fishes

## **B. Subjects of 01 year B.Ed**

- Childhood and Development Years, Contemporary India and Education, Language Across the Curriculum, Understanding Disciplines and Text Reading and Reflections, Learning and Teaching, Assessment for Learning, Drama and Art in Education, Teaching of Physical & Life Sciences, Knowledge and Curriculum, Gender, School and Society, Inclusive School, ICT in Teaching-Learning Process, Understanding the Self, Health and Physical Education, Vocational and Work Education, Education for Peace, Guidance and Counseling.

- C. **General knowledge**: General Knowledge including General knowledge of Himachal Pradesh (10<sup>th</sup> standard).
- D. **Current Affairs** (10<sup>th</sup> standard).
- E. **Everyday Science** (10<sup>th</sup> standard).
- F. **Logical Reasoning** (10<sup>th</sup> standard).
- G. **Social Science** (10<sup>th</sup> standard).
- H. **General English** (10<sup>th</sup> standard).
- I. **General Hindi** (10<sup>th</sup> standard).