Syllabus for the Post of - TGT (Biology/ Chemistry)

General Science

- Magnets and magnetic properties
- Measurement of Length and Motion
- Materials Around Us
- Temperature and its Measurement
- Nature and natural resources types and conservation
- Celestial objects, eclipses, Lunar and solar calendars, constellations
- Electricity: Circuits and their Components, Magnetic and Heating Effects
- Heat Transfer-Conduction, convection, radiation, wind, storms, cyclones, tornados and thunderstorm
- Earth as interconnected system, Nature of solar energy: solar radiation, Solar energy interaction with the Earth's Surface and differential heating of the Earth (the role of the atmosphere and the Earth's surface), Differential warming of the Earth causes winds, Bio-geochemical cycles (water cycle, carbon cycle, nitrogen cycle, oxygen cycle), Human impact on Earth's system
- Measurement of Time and Motion, speed, velocity, acceleration
- Light: Shadows and Reflections, lenses and mirrors, structure of eye
- Exploring Forces, type of forces and properties, Pressure
- Earth - Unique Life Sustaining Planet, Gravitation
- Health and hygiene, types of diseases, prevention & control measures, vectors, pathogens, antibiotics
- Contributions of Indian Scientist in the field of science.

Biology

Cell – Basic unit of life; structure and function of key organelles (nucleus, mitochondria, plastids, endoplasmic reticulum, vacuoles, plasma membrane, cell wall), Permeability of cell membranes, Cellular division and cancer, Recent advancement in cell biology, Biomolecules – Types and structure of Carbohydrates, Proteins, Lipids, Nucleic acids and Enzymes – Types and properties.

Level of organisation in the living organisms – Plant and animal tissue

Types, structure and function

Elementary idea of musculoskeletal system; Care of musculoskeletal system: injuries, postural care, nutrition and exercise

Life processes

Basic concept of nutrition, respiration, transport and excretion in plants and animals.

Control and co-ordination in animals and plants

Tropic and Nastic movements in plants; Introduction of plant hormones; Control and co-ordination in animals: Nervous system; Voluntary, involuntary and reflex action; Chemical co-ordination: animal hormones.

Reproduction in plants and animals

Types of asexual reproduction with examples, Sexual reproduction in flowering plants (flower and its parts, pollination, fertilisation, seed dispersal), Sexual reproduction in humans: male and female reproductive systems (structure and function, formation of gametes, sperm and egg, fertilisation, pregnancy and development of embryo, menstrual cycle), Reproductive health and hygiene, birth control methods and importance

Diversity in living world

Importance of classification, Five kingdoms and their key features with examples, Major division of animals and plants, Binomial nomenclature, Acellular entities: viruses

Heredity, variation and Evolution

Heredity; Mendel's contribution- Laws for inheritance of traits: Sex determination; brief introduction of Evolutionary Theory and evidences, Human Evolution, geological time zone.

Improvement in food production

Plant and animal breeding and selection for quality improvement and management, Use of fertilizers and manures, Protection from pests and diseases, Organic farming.

Ecology

Eco-system and interactions, Environmental issues.

Biotechnology

Basic Principles of Biotechnology.

Chemistry

Nature of matter

Definition of matter, Particulate nature of matter, states of matter: solid, liquid and gas and their characteristics, change of state – melting (absorption of heat), freezing, evaporation (cooling by evaporation), condensation, sublimation; Elements, compounds and mixtures, Homogeneous and heterogeneous mixtures; Solutions, suspensions, colloids and their properties, various ways to express concentration of solutions, Physical and chemical changes, (excluding separation the components of a mixture) pure and impure substances.

Structure of Atom

Atoms and molecules, Laws of chemical combination, Chemical formula of chemical compounds, Atomic and molecular masses, Subatomic particles – electrons, protons and neutrons, Atomic Models (Thomson's Model, Rutherford's Model, and Bohr's Model), electronic configuration, symbols, valency, atomic number, mass number, Isotopes, Isobars, radioactivity, Dalton's Atomic Theory, formula unit mass, ions - ionic compounds and their properties.

Chemical reactions and equations

Chemical equation, Balanced chemical equation, implication of balanced chemical equation, Types of chemical reactions: combination, decomposition, displacement, double displacement, precipitation, endothermic-exothermic reactions, oxidation and reduction.

Periodicity of elements

Classification of elements, Mendeleev's periodic law, Modern periodic law, periodic properties, position of Hydrogen in periodic table.

Acids, Bases and salts

Definitions in terms of furnishing of H^+ and OH^- ions, acid-base indicators - identification using indicators, chemical properties, examples and uses, neutralization, concept of pH scale, importance of pH in everyday life; preparation and uses of Sodium Hydroxide, bleaching powder, baking soda, washing soda, gypsum and Plaster of Paris.

Metals and non-metals

Properties of metals, non-metals and alloys, reactivity series, basic metallurgical processes, corrosion and its prevention.

Carbon and its Compounds

Covalent bonds – formation and properties of covalent compounds, versatile nature of carbon, Hydrocarbons – saturated and unsaturated, homologous series, nomenclature of alkanes, alkenes, alkyne and carbon compounds containing functional groups (halogens, alcohol, ketones, aldehydes), chemical properties of carbon compounds (combustion, oxidation, addition and substitution reaction), ethanol and ethanoic acid (only properties and uses), soaps and detergents. Concepts of hybridization and shapes of molecules structural formula and molecular models, isomerism, IUPAC nomenclature of organic compounds.

Chemistry in everyday life

Antibiotics, antiseptics and antipyretics, polymers.