

Examination Syllabus For TGT (Science)

PERIODIC CLASSIFICATION OF ELEMENTS

Mendeleev's periodic law, Periodic properties of elements, - trends in the periods and groups: Importance of the periodic table, position of hydrogen in the periodic table.

CHEMICAL SUBSTANCES: Nature and behaviour Acid, Bases and Salts: Classical definition of acids and bases, Bronsted- Lowry theory, Lewis concept of acid and bases, relative strengths of acids and bases, logarithmic or p scale- pH, pOH and pK_w, ionic equilibria in a solution Action of indicators on acids and bases, sources of acid and bases, salt- Classification of salts and their pH

CHEMICAL REACTIONS: Formulation of chemical equations, balancing chemical equations, Types of chemical equations with examples.

METALS AND NON-METALS:

Characters of metals and non-metals including all properties and applications: Occurrence of metals in nature: Ores and minerals, enrichment of ores metallurgical operations.

Corrosion: rusting of iron- Prevention of corrosion

CARBON COMPOUNDS: Position of carbon in the periodic table. Concept of hybridization and shapes of molecules structural formula and molecular models, types of reactions undergone by organic compounds, homologous series of compounds having different functional groups, isomerism, IUPAC nomenclature of organic compounds.

Hydrocarbons- Their classification formation of coal and petroleum. Industrial source, preparation and properties of alkanes

Alcohols: Preparation and properties. Qualitative analysis of alcohols, iodoform test, effect of alcohols on living beings. Carboxylic acids: Preparation and properties. Functional group analysis of carboxylic acid. Soaps, detergents, biodegradable detergents. Carbon fibers.

CONSERVATION OF NATURAL RESOURCES: Pollution of river water, Ganga action plan for improving quality of water, Need for sustainable management of natural resources. Development of non-conventional energy resources to prevent pollution and atmospheric conservation.

MAN MADE MATERIAL:

Ceramics, cement, porcelain, glass, carbon fibers, soaps and detergents, polymers, fibers and plastics.

Life Processes:

- What are life Processes.
- Need for Nutrition.
- Different modes of Nutrition in animals.
- What is Photosynthesis.
- Various steps of holozoic nutrition.
- Aerobic and anaerobic respiration.
- Transportation in Human beings.
- Transportation in Plants.
- Transportation in animals.
- Excretion in animals including Human beings.

- Excretion in Plants.

Control & Co-Ordination:

- Animals – nervous system.
- Basic unit of Nervous System in animals.
- Reflexaction.
- Human Brain.
- Co- Ordination in plants.
- Geotropism – Positive, Negative
- Hormones in animals.
- Endocrine & Exocrine glands.

Reproduction:

- Importance of variation.
- Modes of Reproduction used by single organisms.
- Sexual Reproduction in plants and animals.
- Reproduction in Human beings.
- What happens when egg is not fertilized.
- Modes of avoiding pregnancy(family planning)

Heredity and Evolution:

- What is heredity?
- Medals Law of inheritance.
- How is sex determined.
- Evolution & Classification.
- Acquired and inherited traits.
- Homologus and Analogous organs.
- What are fossils?
- Human Evolution.

The Human eye and the colorful world:

- Structure of eye
- Defects of eye and their correction

Natural resources: The fundamental unit of Life:

- What are living organisms made of?
- Structure organization of cell

Tissues:

- Define tissue
- Types of plants tissue and animals tissues

Diversity of living organisms:

- Basis of Classification.
- Classification & Evolution.

- Hierarchy of classification – groups.
- Plantae, Animalia.
- Nomenclature.

Why do we fall ill:

- Health & its failure.
- Diseases and their causes
- Types of diseases- Infectious, Noninfectious.
- Prevention of diseases.
- Communization

NATURAL RESOURCES:

1. Our Environment :

Atmosphere, roll of atmosphere in climate control, wind, rain, environmental pollution: Global warming and green house effect , acid rain, particulate pollutants, smog, formation of photochemical smog. Formation of ozone and its break down ozone hole, causes of ozone hole formation, polar vortex, effects of depletion of ozone hole. Water pollution-oxygen demand, chemical oxygen demand, international standard of drinking water, processing of drinking water. Soil pollution: waste recycling, Strategies to control environmental pollution, its collection and proper methods of disposal.

Biogeochemical cycles: water cycle, nitrogen cycle, carbon cycle, and oxygen cycle.

- Breath of life: Air, Air pollution
- Water a wonderful liquid.
- Water pollution.
- Biochemical cycles. Nitrogen cycle. Carbon cycle. Oxygen cycle.
- The green house effect.
- What is ozone layer. How does it protect the earth. What are the causes of depletion of ozone layer. How can it affect day to day life of living organisms.

Improvement in Food Resources:

- Improvement in crop yield.
- Animal Husbandry.
- Need for Intercropping.
- Cross Breeding.

TEACHING METHODOLOGY

1. The Nature & Scope of Science: A brief introduction of Oriental and Western Sciences, Nature of Science, Scope of Science, Substantive and Syntactic Structure of Science.

2. Aims and Values of Teaching Science: Aims of teaching Science, Values of teaching Science.

3. Objectives of Teaching Science: Importance of Objectives of Teaching Science, Bloom's Taxonomy of Educational Objectives and limitations, Instructional Objectives and Specifications.
4. Approaches and Methods of Teaching Science: Inductive and Deductive Approaches, Methods of Teaching 1. Lecture Method, 2. Lecture cum Demonstration Method, 3. Heuristic Method, 4. Project Method, 5. Experimental Method, 6. Laboratory Method.
5. Planning for effective Instruction: Year Plan, Unit Plan, Lesson Plan – Herbartian and Bloom's Approach, Criteria for Evaluation of Lesson Plan. Self Evaluation and Peer Evaluation, Learning experiences – Characteristics, Classification, Sources and Relevance, Teaching – Learning Material and Resources; Use of Computers.
6. Science Laboratories: Science Laboratory - Planning, Procurement, Care and Maintenance. Safety and First aid, Development of Improvised Apparatus
7. Science Curriculum: Principles of Curriculum Construction, Defects in the existing School Science Curriculum, Correlation of Science with other School Subjects, Qualities of a good Science Text-book.
8. Science Teacher: Qualifications, Qualities, Roles and Responsibilities of a good Science Teacher.
9. Non-formal Science Education: Science club, Eco-club, Science fairs – Objectives, levels of organizations, importance, Role of NGOs and the Government in popularizing science education.
10. Evaluation: Concept and process of Measurement and Evaluation, Continuous and Comprehensive Evaluation, Tools of Evaluation, Scholastic Achievement Test (SAT) – Preparation, Analysis and interpretation.