Paper-I

PUBLIC HEALTH AND SANITATION

(Degree Standard)

CODE NO:110

Unit–I: Chemistry

- Pesticide Chemistry – Composition & reaction of various pesticides. Applied Chemistry – Manufacture of soap, oils, detergents, food products, Adulteration of Consumables.
- Chemical & Physical Properties of Water, pH, treatment methods – hard water – heavy water, Chemicals used for water treatment.
- Chemical formula, Composition of lime & bleaching powder & their reactions.Spot test reagents and tests with them – Cupferron, DMG, thiourea, magneson, alizarin and Nessler reagent.
- Application of coordination compounds – Estimation of nickel using DMG and aluminium using oxine. Estimation of hardness of water using EDTA. Biologically important coordination compounds – Chlorophyll, hemoglobin, vitamin – B12. (their structure and applications). Metal Carbonyls: Mono and Poly nuclear Carbonyls of Ni, Fe, Cr, Co and Mn-Synthesis, structures and bonding.
- Green Catalysis – Heterogeneous – use of zeolites, silica, alumina, supported catalysis – bio catalysis: Enzymes, microbes, phase transfer catalysis (miscellar/surfactant).
- Analytical Chemistry – Data Analysis – Theory of errors – idea of significant figures and its importance with examples – Precision – accuracy – methods of expressing accuracy – error analysis – minimizing errors methods of expresssing precision – average deviation – standard deviation and confidence limit.Purification of solid compounds – extraction – use of immiscible solvents.Chromatography Techniques – Principles – adsorption, partition and ion exchange chromatography, column chromatography – adsorbents – preparation of column – elution, recovery of substance and applications. TLC – choice of adsorbent and solvent – preparation of chromatogram (R_f value) and applications – Paper chromatography – Solvents used – factors affecting R_f value – separation of amino acid mixtures.
- Radioacitivity – Radioactive Emanations, Alpha rays, Beta rays and Gamma rays. The Disintegration theory – Group Displacement Law. Rate of disintegration and Half-life period. Radioactive disintegration series. The Gieger – Nuttal rule – Artificial radioactivity. Induced radioactivity.

Unit–II: Zoology

- Human Physiology – Function of Digestion, Circulation, Respiration, Excretion and Nervous system - Metabolism.
- Ecology – Ecosystem, Food Chain and Food Web, Population Ecology, Human Population environment, Animal Population
- Introduction to Micobes, Zoonosis and Immunology. Insects - Beneficial and harmful insects – Vectors, their life cycle & Metamorphosis- mechanism of causing diseases to human beings & animals - control measures, Domestic pests & their control measures.Rodents & their control
- Genetics, Biomolecules, Chemical bonds, Organic reactions, Catalysis, Volumetric Analysis, Purification of Organic Compounds, Polymers, Chromatography, Laboratory Hygeine and Safety Rules.
- Economic Entomology, Vermiculture, Economic Zoology
- Natural resources – Renewable and Non-Renewable resources. Environment & Sanitation – Air and Ventilation – Solid Waste Management – Bio-Medical Waste – Plastic Waste – Excreta – Liquid filth – disposal of the dead – Personal hygiene, camp sanitation, housing, Industrial and trade, Instruments & equipments for the Control & pests, vectors, rodents & diseases.

Unit–III: Micro biology

- Micro-organism - Beneficial & harmful micro-organisms, Metabolism, Enzymes, Vitamins, Immunology Human Anatomy and Physiology, Human Microbial diseases, Molecular biology and Genetic Engineering Medical Bacteriology, Virology, Mycology and Parasitology Sources of infection & mode of infections. Pathogenic micro organisms & their Control & Management. Mosquitoes, flies, bed bug, louse, fleece, ticks, mites, protozoans – their life cycle triematodes – Cestodes.

- Water borne, air borne diseases, Communical & non-communical diseases. Faecal contamination, coliforms in waterFood Microbiology, Environmental Microbiology and Industrial Microbiology. Microbial genetics, Vermiculture, Ecosystem

- Common diseases – infective diseases insect borne – air borne and water borne. Common diseases of the respiratory system and nervous system.

Unit–IV: Bio-Chemistry

- Nutrition education – Introduction to nutrition education – nutrition education for maternal and child health – Child Nutrition – Nutrition education – methods and media – Nutrition education and family health– Nutrition education in diet therapy –Carbo-hydrates, Proteins & Liquids.
- Chemicals used for the control of disease-causing organisms such as insects, bacteria, virus, actinomycetes, worms, rodents etc. Bio Physical chemistry, Collision Theory, Enzymes, Metabolism of food, Metabolic pathways, Food ecology.
- Genetics, Gene regulation, Vaccines, Bio analytical techniques, Nutritional Biochemistry, Bio Organic chemistry. Human Physiology and nutrition with Microbiology, Virology and basic immunology.
- Various sources of drugs, pharmacologically active constituents in plants. Classification of drugs, chemical – biological – mechanism of drug action– action at cellular sites. Drug receptors and biological responses. Mechanism of different types of drug action.
- Absorption of drugs – factors affecting absorption of drugs, routes of administration – local, enema, oral and external, parental routes – advantages and disadvantages –Indian medicinal plants – tulsi, neem, keezhanelli.
- AIDS – symptoms and prevention.
- Overview of Anesthetics, Antipyretics and anti-inflammatory agents, Antibiotics and Antiseptics and disinfectants. Composition of blood – blood grouping and matching. Blood pressure – Diabetes – and other non Communicable disease.

Unit–V: Public Health

- Public Health Services, Public Health administration, Public Health laboratories, Tamil Nadu Public Health act. Human Anatomy and Physiology, Statistics and basics of Epidemiology
- Drainage, Sanitary Convenience, Abatement of nuisance, Prevention, notification & treatment of diseases, Notified infectious diseases, Maternity & Child Welfare, Sanitation & Buildings, Abatement of Overcrowding, Lodging houses,Food control, Fairs & Festivals, Provisions of acts & rules selected to Public Health & Sanitation, SWM act – 2016, Registration of birth & death act 1969, Act & rules related to Waste Management & environment Management, National health program including AIDS, Polio, control measures of corona, Swine flu, dengue, Immunity & immunization Care & treatment of patients with infection, Disinfection & Sterilization, First aid & emergency care,Vital Health Statistics & maintenance of records.

- Human behaviour, Health Seeking Behavior & Social control, SBCC (Social and Behavioral Change Communication), Public Policy, Disasters and Health Management. Principles and modes of Health education & IEC activities.

Unit – VI: Environmental Science

- Water: Use and over – exploitation of surface and ground water, floods, droughts, conflicts over water (international and inter-state).Water Contamination – BoD, CoD, Eutrophication, dissolved oxygen, flora & fauna in water bodies.
- Ecosystem and Environmental ecology, Ecology and health, Environmental Health, Population growth and explosion and impacts on environment, Role of IT in Environmental Health, Food chain and Web. Human health and welfare, Animal Population and human health
- Environmental Pollution: types, causes, effects and controls: Air, Water, soil and noise Pollution and control measures and management of Nuclear hazards and human health risks.
- Solid and Liquid Waste Management - Control measures of urban and industrial waste.
- Environmental Laws: Environment Protection Act, Air (Prevention & Control of Pollution) Act; Water (Prevention and Control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).
- Resettlement and rehabilitation of projects affected persons.Disaster management: floods, earthquake, cyclone and landslides.Global Climate Change and its impacts. Environmental movements: Chipko, Silent Valley, Bishnois of Rajasthan. Environmental conservation. Environmental communication and public awareness.