

Entrance Syllabus: B. Voc Food Processing & Technology

The question paper will be divided into three sections, **Section A (General Awareness)** and **Section B (Chemistry)** having 50 questions each, is compulsory for all the candidates, whereas, candidates are required to attempt any one of the following subject groups from **Section C** having 50 questions:

1. Biology Group

2. Maths Group

3. Agriculture Group

(The questions will be of up to 10+2 level)

1) General Awareness

2) AGRICULTURE

Crop Production: Targets and achievement in food grain production in India since independence and its future projections, sustainable crop production, commercialisation of agriculture and its scope in India. Classification of field crops based on their utility-cereals, pulses, oils seeds, fibre, sugar and forage crops.

Soil, Soil fertility, Fertilizers and Manures: Soil: characteristics, Essential plant nutrients, functions and deficiency symptoms. Soil types of India and their characteristics, Organic nature, common fertilizers and biofertilizers; integrated nutrient management system.

Irrigation and Drainage. Sources of irrigation, Water requirement of crops, Methods of irrigation and drainage. Watershed management, Weed Control: Principles & methods of weed control, Seed bed preparation, seed treatment, time and method of sowing/planting, seed rate; dose method and time of fertilizer application, irrigation, interculture and weed control; common pests and diseases, integrated pest management, harvesting, threshing, post harvest technology: storage, processing and marketing of major field crops.

Horticulture: Importance of fruits and vegetables in human diet, Crop diversification & processing Industry. Orchard-location and layout, ornamental gardening and kitchen garden. Planting system, training, pruning, intercropping, protection from frost and sunburn. Trees, shrubs, climbers, annuals, perennials-definition and examples. Propagation by seed, cutting, budding, layering and grafting. Cultivation practices, processing and marketing of: Fruit, Vegetables, Flowers, Principles and methods of fruit and vegetable preservation. Preparation of jellies, jams, ketchup, chips and their packing.

3) BIOLOGY

The Living World and Biological Classification- Binomial nomenclature; tools for study of taxonomy-museums, zoological parks, herbaria, botanical gardens. Five kingdom classification. Salient features and classification of plants into major groups. Salient features and classification of animals.

Morphology of Flowering Plants and Anatomy of Flowering Plants- Morphology , modifications, Anatomy and functions of different parts of flowering plants: root, stem, leaf, inflorescence, flower, fruit and seed .

Cell Biology and Biomolecules- Cell theory and cell as the basic unit of life: Structure of prokaryotic and eukaryotic cells; Plant cell and animal cell; Cell envelope, cell membrane, cell wall; Cell organelles- structure and function. Chemical constituents of living cells. Cell

cycle, mitosis, meiosis and their significance.

Plant Physiology-Transport in Plants, Mineral Nutrition, Photosynthesis in Higher Plants, Respiration in Plants and Plant - Growth and Development

Animal Physiology – Integumentary system, Digestive system, circulatory system, Skeletal system, Respiratory system, Circulatory system, Excretory system, Nervous system, Endocrine system, Reproductive Biology

Genetics and Evolution- Principles of Inheritance and Variation, Molecular Basis of Inheritance, Evolution-Origin of life; Biological evolution and evidences for biological, Darwin's contribution, Modern Synthetic theory of Evolution; Mechanism of evolution - Variation (Mutation and Recombination) and Natural Selection with examples, types of natural selection.

Application Biology- Human Health and Diseases (Malaria, Filariasis, Ascariasis, Typhoid, Pneumonia, common cold, amoebiasis, ring worm); Basic concepts of immunology - vaccines; Cancer, HIV and AIDS; Adolescence, drug abuse. Strategies for Enhancement in Food Production, Application of Biotechnology in health and agriculture: Human insulin and vaccine production, Genetic engineering (Recombinant DNA technology).

Ecology and Environment: Patterns, components; productivity and decomposition; energy flow; pyramids of number, biomass, energy; nutrient cycles (carbon and phosphorous); ecological succession; ecological services - carbon fixation, pollination, seed dispersal, oxygen release (in brief).

Air pollution and its control; water pollution and its control; agrochemicals and their effects; solid waste management; radioactive waste management; greenhouse effect and climate change; ozone layer depletion; deforestation; any one case study as success story addressing environmental issue(s).

Concept of biodiversity; patterns of biodiversity; importance of biodiversity; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, biosphere reserves, national parks, sanctuaries and Ramsar sites.

4) PHYSICS

Units and dimensions, SI units, displacement, velocity, kinematics in one and two dimensions with constant acceleration, projectiles, motion, concepts of relative motion, circular motion. Newton's

Laws of motion, concepts of inertial frame, momentum and energy, universal law of gravitation, variation of the acceleration due to gravity with altitude and latitude. Kepler's Law of motion of planets and satellites, simple harmonic motion.

Centre of mass of a system of particles, elastic and inelastic collision in one dimension, rigid bodies, moments of inertia of simple shapes like ring, disc, cylinder and sphere, angular momentum, torque, conservation of angular momentum. Hook's law. Young's Modulus, shear and bulk moduli, principle of buoyancy, pressure in a fluid, wave motion. Concepts of amplitude, frequency and phase, longitudinal and transverse waves, progressive and stationary waves, vibration of string and air columns, resonance, Doppler's effect, Thermal expansion of solids, liquids, and gas, gas laws, absolute temperature, specific heat, C_p , C_v , isothermal and adiabatic processes, calorimetry, latent heat, equivalence of heat and work, conduction, convection and radiation, Elements of Kinetic Theory of gases, pressure of an ideal gas, equipartition of energy.

Coulomb's law, electric field, lines of force, electric potential. capacitors in series and parallel, energy stored in a capacitor, electric current Ohm's law, Series and parallel arrangement of resistances and cells, Krichoff's Laws, Wheatstone bridge and its applications, heating effect of current, current carrying wire in a magnetic field, moving coil, galvanometer, ammeter, voltmeter, Ampere's law, Faraday's Law, Lorentz Force, effect of magnetic field on current carrying conductors, Maxwell's equations, curved mirrors and thin lenses, of light, interference phenomena, Young's double slit experiment, fringe width, polarization of light, cathode rays radioactive law of decay, half life, photo-electric effect, Bohr's theory of hydrogen like atoms, X-rays production and properties, diode rectification and triode amplification, Atomic nucleus, binding energy. Nuclear energy by fission and fusion, elementary properties of semi conductors and devices based on them, Michelson Morley experiment, postulates of special theory of relativity.

5) CHEMISTRY

Some Basic Concepts of Chemistry, Solid State, Structure of Atom, Classification of Elements and Periodicity in Properties, , Chemical Bonding and Molecular Structure. Chemical equilibrium, Electro-chemistry, Chemical Kinetics, States of Matter: Gases and Liquids, Surface Chemistry, Solutions, Thermodynamics, Redox Reactions.

General Principles and Processes of Isolation of Elements, Equilibrium, p- Block Elements, d and f Block Elements, Hydrogen, Ozone, Coordination Compounds, s-Block Element (Alkali and Alkaline earth metals), , Some p-Block Elements.

Organic Chemistry- IUPAC Nomenclature, Isomerism, Some Basic Principles and Techniques, Hydrocarbons (Alkanes, alkenes, alkynes), haloalkanes, Alcohols, Phenols and Ethers, Aldehydes, Ketones and Carboxylic Acids, Carboxylic acid derivative, Substituted and unsubstituted aromatic compounds, Nitrogen containing organic compounds , Environmental Chemistry, Biomolecules, Polymers, Chemistry in Everyday Life.

6) MATHS

Algebra: Arithmetic and geometric progressions, arithmetic mean, geometric mean, harmonic mean and related inequalities, polynomial equations, roots of polynomials, matrices, determinants, linear equations, solvability of equations, binomial theorem and multinomial theorem, permutations and combinations, mathematical induction. prime numbers and divisibility, GCD, LCM, modular arithmetic logarithms, probability.

Geometry: Vectors, triangles, two dimensional geometry of Conics - straight lines, parabola, hyperbola, ellipses and circles, tangents, measurement of area and volume, co-ordinate geometry.

Trigonometry: addition, subtraction formulas, double-angle formulas.

Calculus: Limits, continuity, derivatives, integrals, indefinite and definite integrals, maxima and minima of functions in a single variable, series and sequences, convergence criterion.

Complex numbers, roots of unity.