CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE
MYSORE

SYLLABUS FOR ENTRANCE TEST FOR M.Sc. (FOOD TECHNOLOGY)

The question paper will contain multiple-choice questions on the following topics. There will be balanced distribution of questions from each of the subjects listed below, so that students from various streams at Graduation level will get equal opportunity to score in the examination.

Subjects covered — Basics of Physics / Chemistry / Mathematics / Botany & Zoology / Food Microbiology & Biotechnology, Biochemistry & Nutrition /Agriculture & Dairy Technology / Food Engineering / Mental Ability/ General Awareness

Physics

Elements of mechanics, units and dimensions, laws of motion, kinetic theory of gases, gravitation, thermal expansion, heat transfer, friction, work, energy, and power; systems of particles and rotational motion, simple harmonic motion, wave motion, doppler effect, electric field, potential, and capacitance, current electricity, magnetic effects of current, electromagnetic induction, reflection, refraction, lenses, wave optics: interference, diffraction, polarization, photoelectric effect, atomic structure, nuclear physics

Chemistry

Mole concept, atomic structure, Chemical bonding and molecular orbital theory, Thermodynamics and thermochemistry, Equilibrium (chemical and ionic), Redox reactions and electrochemistry, Surface chemistry and colloids, Kinetics, Periodic table and periodic properties, Chemical bonding, s-, p-, d-, f-block elements, Coordination compounds, Environmental chemistry, Hydrocarbons, alcohols, phenols, ethers, aldehydes, ketones, carboxylic acids, Amines and biomolecules (carbohydrates, proteins, vitamins, nucleic acids), Polymers and everyday chemistry, Food Chemistry: Composition of foods, minerals in foods, water activity in foods. Carbohydrates: Mono and disaccharides, reducing and non-reducing sugars, starch, cellulose, pectins, plant acids and Proteins: Primary, secondary and tertiary structure of proteins. Protein denaturation, peptide bond, amino acids.

Mathematics

Sets, Relations, Functions, Complex numbers, Quadratic equations, Sequences, series, Binomial theorem, Limits, Continuity, Differentiation, Integration, Applications, Differential equations (basics), Straight lines, Circles, Conic sections, 3D geometry, Vectors, Identities, Inverse trigonometric functions, Heights and distances, Mean, Median, Mode, Variance, Standard deviation, Basic probability, Random variables, Distributions

Botany & Zoology

Cell structure and organelles, Mitosis and meiosis, DNA and RNA structure and function, Systematics of plants, Ecology and Evolution, Photosynthesis and respiration, Plant hormones and growth, Plant anatomy, cytology, tissue culture and biotechnology applications, Elements of genetics, Organization of animal tissues, General physiology of animals, Systematics of animals, Human anatomy and physiology (digestive, circulatory, nervous systems), Reproduction and endocrinology, Mendelian genetics, linkage and mutation, evolutionary theories.

Microbiology & Biotechnology

Historical developments in microbiology, structure and classification of microorganisms, Microbial growth and control, Culture media, sterilization techniques, Food spoilage microorganisms, Food contamination, control and food safety; General principles of food preservation; Industrial Microbiology; Fermentation technology: Starter cultures, probiotics and prebiotics, Recombinant DNA technology, Genetic engineering, CRISPR, GM foods, Biosafety regulations

Biochemistry & Nutrition

Carbohydrates, proteins, lipids, nucleic acids, enzyme and enzyme kinetics, Metabolic pathways (glycolysis, TCA, lipid metabolism), Vitamins and minerals, Analytical techniques (spectroscopy, chromatography), RDA and dietary guidelines, Nutritional assessment, Deficiency disorders, Nutraceuticals, Functional foods

Agriculture and Dairy Technology

Agriculture: Weather and crops; Soil and water resources; Soil and water conservation, soil fertility and fertilizer use; Cropping patterns and weed control; Diseases, insect pests and nematodes of crops: Agricultural Engineering; Agriculture marketing and storage; Farm management; Field crops, Plantation crops: Commercial crops, Horticultural crops; Condiments, Spices, Medicinal and Aromatic plants, Plant breeding, animal husbandry.

Dairy science: Chemistry of milk, milk standards, milk composition, pasteurization, homogenization, dairy product processing (paneer, curd, butter), Quality control in dairy, Adulteration and detection methods, animal husbandry basics

Food Engineering

Units, dimensions and conservations; Fundamental of fluid flow; Pressure, energy and head relationships and their measurements; Emulsions – basics and examples; Unit operations, Basics of mixing, Equipment and applications, Separation processes; Centrifugation and filtration; Mechanical operations; Size reduction and sieve analysis; Power and steam generators; Strength of materials – Basics; Heat exchangers; Plant layout, Packaging, Cleaning-in-place (CIP), Sanitation in processing plants

Mental Ability

Analogy, classification, series, coding-decoding, blood relations, direction sense test, logical venn diagrams, alphabet test, sitting arrangements, mathematical operations, arithmetical reasoning, inserting the missing character, number ranking and time sequence test

General Awareness on health & wellness

Sustainable Development Goals (SDG), Carbon footprint, Circular economy, Machine Learning, Food Safety and Security, Food and nutritional labelling, Quality Management Systems, Vaccine development and drug testing, R&D Institutions, Welfare schemes of Government.

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