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

Physics- Elements of mechanics, Laws of Thermodynamics: Mode of heat transfer: Electrostatics, magnetism and electrodynamics: Outlines in optics and Sound: Electro-magnetic radiation: Radioactivity and elements in quantum physics.

Chemistry -The gas laws, properties of gases, colligative properties, thermochemistry, chemical bonds, chemical equlibria, chemical kinetics, concept of pH and buffer, molecular orbital theory, chemical bonds and the forces involved therein: periodic table; Aliphatic and aromatic hydrocarbons, Organic substitution reactions, electrophilic and neucleophilic reactions; Isomerism; structural and optical isomers.

Food Chemistry: Composition of foods, minerals in foods, water activity in foods. Carbohydrates: Mono and disaccharides, reducing and non-reducing sugars, mutarotation, starch, cellulose, pectins, plant acids and Proteins: Primary, secondary and tertiary structure of proteins. Protein denaturation, peptide bond, amino acids.

Botany: Systematics of plants, Ecology and Evolution, cytology and physiology of plants, Economic botany, Tissue culture and biotechnology applications.

Zoology: Molecular basis of life, Nucleic acids and their role in life, Elements of genetics, Organisation of animal tissues, Elements in human anatomy and physiology, endocrine glands, digestion, absorption, respiration, General physiology of animals, Systematics of animals.

Microbiology : Historical development in Microbiology, Morphology, Cytology; reproduction and genetics of bacteria, yeasts and moulds. Culture technique and identification; Stains and staining techniques, Growth, Nutrition and physiology of micro-organisms. Economic importance of bacteria, yeast and moulds; Food contamination, control and food safety; General principles of food preservation; Microbiological standards for foods. Industrial Microbiology.

Food Biotechnology, Biochemistry & Nutrition: Cell Biology, Molecular Biology, Enzymes, Coenzymes and cofactors; Hormones. Elements of carbohydrate, fat and protein metabolism; elements of photosynthesis; Vitamins and their function in the body; Minerals and their function in body; Nucleic acids and their importance, Food and health.

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: Dairy cattle management; Diseases of cattle, Chemistry of milk, milk standards.

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

Statistics : Displaying and describing data, the normal curve, regression, probability, statistical inference, confidence intervals, and hypothesis tests with applications in the real world.

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.