SYLLABUS FOR GSAT-2020

For admission to M.Sc. Biochemistry & Molecular Biology/Biotechnology/Food Science & Technology/Microbiology

Test Code: 102 A

Classification, structure, properties, functions, metabolic pathways and disorders of carbohydrates, lipids, amino acids, proteins and nucleic acids.

Laws of thermodynamics, concepts of free energy, entropy and enthalpy. Activation energy, rate of reaction, order of reaction and factors influencing the rate of a reaction. Nomenclature, preparation and properties of Alkanes, Alkenes, Alkynes. Aromaticity. Isomerism. Acid-base theories, oxidation-reduction reactions, pH and buffers. Solutions. Organic reactions - addition, substitution, free radical reactions and elimination reactions.

Structure of Prokaryotic and Eukaryotic cells. Structure and composition of Plasma membrane. Cell division - Mitosis and Meiosis. Ultra structure and functions of Cell organelles. Photosynthesis and photorespiration. Biological nitrogen fixation, Nitrogen cycle and Phytohormones.

Principles of Mendelian inheritance, back cross and test cross. Linkage and crossing over. Sex linkage, Sex determination and Cytoplasmic inheritance. Mutations. Biosphere, Biodiversity, Plant succession, Biological pyramids, food chain, food web. Theories of Organic Evolution.

Classification invertebrates and vertebrates. Structure and function of kidney, liver and heart. Physiology of muscle and nerve. Digestion and absorption of food. Vitamins, hormones and Mineral metabolism. Calorific value of food stuffs, Respiratory quotient, BMR.

Nomenclature and classification of Enzymes. Factors affecting enzyme activity– Temperature, pH, substrate concentration. Enzyme inhibition, Coenzymes, metalloenzymes, allosteric enzymes, and isoenzymes.

DNA replication, transcription and translation in prokaryotes and eukaryotes.

Principles and applications of chromatography, electrophoresis, centrifugation, Spectroscopy and microscopy. Application of radio isotopes in biological sciences. Genetic engineering; cloning vectors, Blotting techniques DNA sequencing, gene transfer techniques and applications.

Concepts of immune response, cells and organs of the immune system, Antigen and antibody reactions: Precipitation and agglutination. Principle of vaccination and types of vaccines

Structure of bacteria and viruses and their classification. Bacterial staining techniques. Isolation and cultivation of Bacteria and Bacteriophages. Bacterial growth curve. Methods of sterilization and pasteurization. Clinically important bacteria and viruses. Bacterial recombination-transformation, conjugation and Transduction.

MODEL QUESTIONS

1. Name of biomolecule that acts as genetic material [ ]
   a) protein b) carbohydrate c) DNA d) lipid

2. Which cell organelle is absent in prokaryotes [ ]
   a) mitochondria b) ribosome c) chloroplast d) nucleus

3. Which division occurs in germ cells [ ]
   a) binary fission b) amitosis c) mitosis d) meiosis.

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