

YVUCET - 2019: SYLLABUS
TEST - 101: ADVANCED LIFE SCIENCES
COMMON ENTRANCE EXAMINATION – 2019 FOR ADMISSION INTO
M.Sc. BIOCHEMISTRY/BIOTECHNOLOGY/GENETICS & GENOMICS/
MICROBIOLOGY

Section – A (Marks - 30)

Biomolecules : Carbohydrates: Classification, Structure and biological importance of monosaccharides, disaccharides and structural polysaccharides. **Amino Acids:** Classification, structure, stereochemistry, chemical reactions of amino acids. Peptide bond -nature and conformation. **Proteins:** Classification and functions. **Lipids:** Classification, Structure and Properties of fats and oils . **Nucleic acids:** Nature, Structure of purines and pyrimidines, nucleosides, nucleotides. DNA and RNA. **Enzymes:** Nomenclature and classification of enzymes. Interaction between enzyme and substrate-lock and key, induced fit models. Definition of holo-enzyme, apo-enzyme , coenzyme, cofactor. **General characters and classification** of Protozoa, Porifera, Annelida, Helminthes, Arthropoda, Echinodermata, Pisces, Reptiles, Avian, Mammals. **Composition and functions of blood,** Coagulation of blood. **Animal hormones**-pituitary,thyroid,Adrenal and pancreatic. **General Microbiology:** Isolation and growth of Bacteria. Gram's staining- Gram positive and Gram negative bacteria. Sterilization and disinfection techniques,culture media. Introduction to Biochemical Techniques.

Section – B (Marks – 30)

Cell Biology and Genetics: Cell theory and cell as the basic unit of life; Structure of prokaryotic (bacteria) and eukaryotic cell (Plant cell and animal cell), Structure and function of cell organelles- Endoplasmic reticulum, Golgi bodies, lysosomes, vacuoles; mitochondria, ribosomes, plastids, microbodies; Cytoskeleton, cilia, flagella, centrioles, Nucleus–nuclear membrane, chromatin, nucleolus. Cell division : Cell cycle, mitosis, meiosis and their significance. DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Transcription, genetic code, translation. Mendelian principles of inheritance; General account of mutations and their significance, **General characters and classification** of Algae, Fungi, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms. **Photosynthesis:** Light and Dark reactions, Calvin cycle, C₄ Pathway. **Plant hormones:** Types and Functions. **Metabolism:** Glycolytic pathway, Citric acid cycle, Gluconeogenesis., oxidative phosphorylation, and fermentation, **Nitrogen metabolism:** Biological nitrogen fixation, nitrate reduction. Introduction to Immunology Types of Immunity: Cells and organs of Immunesystem, Antigens , Anti bodies, Antigen- Antibody Reactions, Vaccines.

Section – C (Marks - 40)

Inorganic Chemistry – Atomic Structure, Periodic Properties, Chemical Bonding, s-Block Elements, p-Block Elements, Chemistry of noble Gases. **Organic Chemistry** - Structure and Bonding, Mechanism of Organic Reactions, Stereochemistry of Organic Compounds, Alkanes and Cycloalkanes, Alkenes, Cycloalkenes, Dienes and Alkynes, Arenes and Aromaticity and Alkyl and Aryl halides. **Physical Chemistry** - Gaseous State, Liquid State, Solid State, Colloidal State and Chemical Kinetics & Catalysis.