

KANNUR UNIVERSITY

DEPARTMENT OF MOLECULAR BIOLOGY

M.Sc. MOLECULAR BIOLOGY ENTRANCE EXAMINATION, MAY 2019

SYLLABUS

UNIT- I Bio-Energetic & Biological Interaction:

Hydrophobic and hydrophilic Interactions, Acid-base equilibrium, Soaps and detergents, Laws of Thermodynamics, Concepts of heat reaction, Concept of chemical bonding, Electron displacements, Enthalpy, Entropy, Dipole-dipole interaction, Hydrogen bond, Vander-Waal's forces.

UNIT-II Bio-molecules:

Carbohydrates, Lipids, Proteins, Vitamins and nucleic acids-Types, structure and function.

UNIT-III Cell biology:

Prokaryotic and eukaryotic cell-structure and organelle functions. Functions of sub-organells of cell i.e., Nucleus, Endoplasmic reticulum, Golgi apparatus, Peroxisomes and mitochondria. Structure of Cell membrane types and regulation of transport.

UNIT-IV Metabolism:

Carbohydrates, Lipids, amino acids and nucleotides, turn over and its regulation, Metabolic disorders, Glycolysis, TCA cycle, Urea cycle, Gluconeogenesis, Glyoxalate cycle and pentose phosphate pathway.

UNIT-V Molecular Biology:

Prokaryotic and eukaryotic Replication, Transcription, Translation mechanism and their regulation, DNA Repair systems, Recombination, DNA sequencing.

UNIT-VI Concept of Recombinant DNA Technology:

Genetic engineering techniques, Cloning vectors: Plasmids, Bacteriophages, Cosmids, Restriction enzymes, Ligases, PCR.

UNIT-VII Immunology:

Innate and adaptive immunity, Antigen and super antigens. Structure and functions of immunoglobulin. T-cells and B-cells, autoimmune diseases, immunotechniques, vaccines.

UNIT VIII Bio-Techniques:

Principles, types and applications of Chromatography, Centrifugation, Electrophoresis, Spectrophotometry and Blotting techniques. Natural and artificial radioactivity.

UNIT- IX Genetics:

Mendelian laws of inheritance and their application, non-Mendelian inheritance, linkage and crossing over, gene mapping, theories of mutation and evolution, Genetic disorders, population genetics.

UNIT-X Microbiology:

Structure and organization of microbial cells, Microbial growth, Transformation, Transduction, Conjugation. Virus –structure and life cycle, micro and macro fungi, Antimicrobial agents. Drug resistance

UNIT-XI Enzymology:

History, general characteristics, nomenclature and classifications of enzymes, enzyme activity and factors affecting enzyme activity, Competitive and uncompetitive inhibition, allosteric enzymes, co enzymes, co factors, enzyme kinetics.

UNIT-XII Chemistry:

Structure and Bonding-Organic Chemistry-Inorganic Chemistry-Physical Chemistry-Analytical Chemistry

UNIT-XIII Botany:

Cryptogams, Plant Pathology, Cytology, Phanerogam, Ecology, Physiology-Biochemistry, Plant Metabolism, Cytogenetics, Photosystems, Flowering, plant hormones, concept of ecosystem, biological cycles, biomes, population interactions.

UNIT-XIII Zoology:

Animal Diversity, Comparative Physiology, Endocrinology, Developmental Biology, Animal Behavior, Functional and comparative Anatomy of Non chordates, Mammalian Physiology.

GUIDELINES

1. The entrance test will cover Molecular Biology, Biotechnology, Microbiology, Cell Biology, Genetics, Biochemistry, Botany, Zoology and related areas at the undergraduate level.
2. The Examination consists of 100 multiple -choice questions. Each question will be provided with four choices (a), (b), (c) and (d) having one correct answer.
3. Each correct answer carries four marks. Negative marking will be adopted for incorrect answer. 1 mark will be deducted for each incorrect answer. No mark will be given for unattended questions
4. The duration of examination will be 2 Hours

Sd/

**HEAD
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