

Multidisciplinary Centre for Advanced Research & Studies
Jamia Milia Islamia, Jamia Nagar, New Delhi

MSc Virology Entrance Examination Syllabus

Biology

1. Biomolecules, carbohydrates, amino acids, fatty acid, concepts of enantiomers, epimers, anomers, mutarotation, phosphodiester bond, glycosidic bond, peptide bond.
2. Structure and function of Nucleic Acids, DNA, RNA, Proteins, Carbohydrates, Lipids.
3. Ultra-structure of cell and its organelles.
4. Membrane structure and transport, active and passive transport, facilitated transport.
5. Metabolic pathways: glycolysis, Krebs cycle, Salvage pathway for nucleic acid synthesis, fatty acid metabolism, cholesterol and its important derivatives.
6. Enzyme kinetics, activation energy, order of reaction, rate of reaction, Michaelis-menten equation, various kinds of inhibition, units of enzyme activity, half-life.
7. DNA replication, Recombinant DNA Technology, PCR and its applications.
8. Antibodies functions and structures, polyclonal and monoclonal antibodies, hybridoma technique.
9. Human Genetics, Mutation & Disorder/Diseases, Chromosomal anomalies (polyploidy, aneuploidy, translocation, truncation).
10. Structure and function of T- and B-Cells, cytokine and chemokines
11. Principle and application of DNA and protein gel electrophoresis
12. Eukaryotic and prokaryotic cell components, difference in the membrane structure and cytoskeletal elements.
13. Classification and Function of medically, socially and economically important microbes, Viruses, Parasites, Fungi and Algae.

Chemistry

1. Avogadro's number, Mole, Mole fraction, Molarity, Normality, Molality, Equivalent weight, Molecular weight, Normality, Molality, Acid base indicators. isoelectric pH, pKa value.
2. Concept of acids and bases. Ionic product of water. pH, Buffers, buffer capacity, preparation of buffer solutions.
3. Characteristics and units of radioactive elements, disintegration constant, Half-life, α , β and γ radiation.
4. Osmotic pressure, Hypo, hyper and isotonic solutions.

5. Ionic bond, covalent bond, co-ordinate bond, Van der Waal's forces, ion- dipole, dipole –dipole interactions, Hydrophobic interaction, Hydrogen bonding
6. Definition and Classification of Primary, Secondary and Tertiary alcohols.
7. Chirality, Nomenclature of enantiomers, diastereomers. Racemisation and resolution, Geometrical isomerism