

Syllabus for M.Sc. (Microbiology) Entrance Examination-2017

Pattern for Entrance Examination:

The paper will consist of 50 multiple choice questions (MCQ) of one mark each (five questions from each unit). There shall be no negative marking.

1. **Biochemistry:** Proteins Carbohydrates, Lipids, and nucleic acids: properties, types and uses. Enzymes and various kinetic parameters, respiration and photosynthesis.
2. **Bio-techniques:** Principles and applications of chromatography, spectroscopy, microscopy, electrophoresis, centrifugation, PCR & radioisotope techniques.
3. **Anatomy and Physiology:** Plant and animal hormones and vitamins, transport mechanisms, meristems, primary & secondary tissues, primary structure of plant body, secondary growth, mineral nutrition, absorption, water & solute transport, transpiration, photosynthesis, respiration, plant movements, growth & senescence, plant tissue culture. Animal: digestive, cardiovascular, nervous, respiratory systems, reproductive systems.
4. **Cell biology:** Eukaryotic and Prokaryotic cell structure, cell organelles, cytoskeletons, cell surface and junctions, cell to cell communication.
5. **Genetics and genetic engineering:** Mendel's laws of inheritance, chromosomal and molecular basis of inheritance, genetic basis of development, population genetics. Recombinant DNA technology, principles of gene cloning, applications of biotechnology in medicine, industry and agriculture, animal & plant cell culture, environmental biotechnology.
6. **Molecular Biology:** DNA as genetic material, mechanisms and regulation of prokaryotic and eukaryotic DNA replication, transcription, translation, DNA repair.
7. **Microbiology:** Animal and plant viruses and bacteriophages, bacteria, fungi, algae and their economic importance, microbial growth and nutrition.
8. **Immunology:** Nonspecific and specific defense mechanism against various pathogens adopted by both plants and animals.
9. **Ecology, evolution and biodiversity:** Introduction to ecology and the biosphere, behavioral, population and community ecology, various ecosystems and conservation biology, prokaryotic and eukaryotic biodiversity, mechanisms of evolution.
10. **Some Basic Concepts of Chemistry:** Atoms, molecules, elements, mixtures, basic physical quantities & units, atomic number & mass numbers, atomic and molecular masses. Mole concept, Molar mass; percentage composition. Gas Laws (Boyle's law, Charle's law, Gay Lussac's law, Avogadro's law) Kinetic theory of gases, Ideal behavior, empirical derivation of gas equation, Ideal gas equation. Types of equilibrium, law of mass action, equilibrium constant, factors affecting equilibrium, Le Chatelier's principle; ionic equilibrium –ionization of acids and bases, strong and weak electrolytes, pH & its measurement, buffer solutions, buffer action, biological buffers, Henderson equation for buffers, precipitation & condition for precipitation, hydrolytic reactions, types of hydrolysis.