Microbiology

PET Syllabus

Section - (B)

Multiple - choice questions will be related to the following topics:

- Common terminologies, abbreviations and formulae used in microbiology. Role of Government ,Non Government and cooperative organizations in development of microbial Science.
- Place of microorganisms in nature, cell and its structure, Grouping of prokaryotes, Viruses: distribution and structure , Fungi (Mycota),Growth of microorganism.
- Microbial Metabolism: Basic mechanism of metabolism and energy conversion, Special fermentations, Electron transport under aerobic conditions, incomplete oxidation and microbial biotechnology .
- Inorganic hydrogen donors: Aerobic chemolithotrophic bacteria, phototrophic bacteria and photosynthesis, Fixation of molecular nitrogen, Degradation of natural substances.
- Constancy, Change, Recombination and transfer of genetic information, Regulation of metabolism. Microbial genetics and genetic engineering.
- Role of microbes in Industry. Microbial technogical applications in food, agriculture and health.
- Microorganisms and the Environment, microbial ecology, ecosystems, microbes as symbiotic partners. Mutualistic and antagonistic microorganism and evolution of earth. The evolution of microorganism.
- Principles & practices of waste management. Role of microbes in recycling of wastes. Microbes in Pollution control.

Unit –I, **General Microbiology:**

Structure of prokaryotic & eukaryotic cell, classification, & reproduction of bacteria & viruses. A general account of mycoplasma, protozoa & yeast. Archaebacterial diversity. Microbes in decomposition & recycling process, symbiotic & asymbiotic Nitrogen fixation. Microbiology of water, air & sewage.

Unit-II, Microbial Physiology & Metabolism

Microbial Nutrition & Growth, Physiology of Autotrophic microorganism. Bacterial permeation & transport. Morphogenesis & differentiation in microorganisms. Bioenergetics, catabolic pathway, EMP, HMP, ED, Phosphoketolase pathway, TCA cycle. Anaplerotic sequences. Biosynthesis & endogenous metabolism.

Unit –III, **Immunology**

Antigen & immunoglobulin, primary & secondary immune response. Lymphocytes & accessory cells. Hummoral & cell mediated immunology, MHC mechanism of immune response & generation of immunological diversity .Genetic control of immune response effector mechanism .Application of immunological technique.

Unit-IV, **Microbial Technology**

Microbial fermentation, organic acid, amino acid, vitamins. Production of therapeutic compounds: Antibiotics, Vaccines& Enzymes. Biotransformation of steroids & sterols. Modern trends in microbial production of Biopolymers, Bioplastics, Biofertilizers & Bioinsecticides.

Unit-V, **Microbial Genetics & Molecular biology**

Genome organizations, DNA replication, damage & repair. Recombination: Gene transfer mechanism in bacteria, complementation. Organization of transcriptions unit, mechanism of transcription of Prokaryotes & Eukaryotes, RNA processing, Ribonucleoproteins, structure of mRNA, Genetic code & proteins synthesis. Regulation of gene Expression, operon concepts. Lysogeny & lytic cycle in bacteriophage. Principle & Method of genetic engineering & gene targeting .Application in agriculture health & industry.