



## Subject-specific Entrance Test Table Of Specification PhD (Microbiology)

	Theme	Topic
1	Microbial Genetics and Molecular Biology	Structure and function of microbial DNA, RNA, and proteins Mechanisms of gene expression and regulation in bacteria and viruses Horizontal gene transfer mechanisms and genetic recombination. Microbial genomics and applications
2.	Microbial Biochemistry and Metabolism	Enzymes in microbial pathways Metabolic diversity in microbes: aerobic and anaerobic respiration, fermentation Microbial culture media Growth and nutritional requirements of microorganisms Microbial products of industrial use.
3.	Microbial Physiology and Ecology	Environmental factors affecting microbial growth Microbial stress responses. Biofilm formation and its physiological implications Microbial survival strategies
4.	Microbial Pathogenesis and Immunity	Host immune responses to microbial infections Molecular diagnostics in microbial infections Microbial evasion mechanisms against immune system Toxin production by microorganisms
5.	Antimicrobials and Resistance	Mechanisms and targets of various classes of antibiotics Antiviral, antifungal, and antiparasitic strategies Emerging strategies in antimicrobial therapy Mechanisms of drug resistance.
6.	Advanced Microbiology and Immunological Techniques	Advanced techniques in microbiological research The microbiome and its impact on health and disease Vaccinology and immunotherapies based on microbial antigens
7	Biosafety and Biosecurity	Principles of Biosafety and Biosecurity Biosafety levels Disposal of Biological waste Good laboratory practice