Table of Specification –PhD Pathology (Microbiology) Spring 2026
NUMS Entry Test

Sr. No	Topics	MCQs
	Level of Difficulty	**Application**
1	**Bacterial cell structure including following topics**: o Structure of cell wall and its components. o Cytoplasmic structures o Nucleus **Pathophysiology of bacterial growth and disease including following topics**: o Bacterial growth phases o Bacterial cell metabolism o Bacterial normal flora o Virulence factors	10
2	**Sterilization & Disinfection principles applicable in Microbiology** o Autoclave use and principle o Monitoring of autoclave o Disinfectants types and uses **Sample collection for microbiology including following topics** o Recommended Blood culture collection technique o Recommended Urine culture collection technique o Recommended respiratory specimen culture collection technique o Recommended CSF culture collection technique o Other body fluids	15
3.	**Types of culture media and their use including** • Liquid and solid media • Basic, enriched, differential and selective media • Transport media **Specimen dealing for culture and susceptibility** • Recommended guidelines for each specimen • Clinical laboratory standard institute (CLSI)	12
4.	**Staining techniques used in Microbiology**: o Gram stain and its principle o ZN stain and its principle	10

	○ Albert's stain **Common instruments used in Microbiology** • Centrifuges • Water bath • Incubators • ELISA • Media pouring machines • Automated culture like BACTEC	
5.	**Classification of bacteria and biochemical tests for identification**: a. Gram positive bacteria and common biochemical tests b. Gram negative bacteria and common biochemical tests c. Analytical profile Index (API)	10
6.	**Microbiology specific Laboratory Management** ○ Biosafety and biosecurity principles ○ Quality control procedures in microbiology ○ Principles of infection control in hospital ○ Laboratory information management system (LIMS)	08
7.	**Mycology including classification of yeasts and moulds** Mycobacteriology including modalities of TB diagnostics specific to microbiology	05
8.	**Molecular Biology** ○ DNA: Structure and Function ○ RNA: Structure and Function & Types ○ Protein: Structure and Function ○ DNA regulatory sequences and regulatory protein ○ DNA Replication, Damage and Repair ○ Transcription/ Translation in Prokaryotes& Eukaryotes	10
9	**Techniques** ○ PCR types and procedure ○ DNA/RNA Extractions ○ Restriction Endonucleases ○ Recombinant DNA technology Gel Electrophoresis	05
10.	○ Research Methodology ○ Biostatistics/Analytical ○ Medical writing/Bioethics	15
Total		**100**