

Table of Specification – PhD Pathology (Microbiology) Spring - 2024
NUMS Entry Test

Sr. No	Topics	MCQs
	Level of Difficulty	Application
1.	<p>Bacterial cell structure including following topics:</p> <ul style="list-style-type: none"> ○ Structure of cell wall and its components. ○ Cytoplasmic structures ○ Nucleus <p>Pathophysiology of bacterial growth and disease including following topics:</p> <ul style="list-style-type: none"> ○ Bacterial growth phases ○ Bacterial cell metabolism ○ Bacterial normal flora ○ Virulence factors 	10
2.	<p>Sterilization & Disinfection principles applicable in Microbiology</p> <ul style="list-style-type: none"> ○ Autoclave use and principle ○ Monitoring of autoclave ○ Disinfectants types and uses <p>Sample collection for microbiology including following topics</p> <ul style="list-style-type: none"> ○ Recommended Blood culture collection technique ○ Recommended Urine culture collection technique ○ Recommended respiratory specimen culture collection technique ○ Recommended CSF culture collection technique ○ Other body fluids 	15
3.	<p>Types of culture media and their use including</p> <ul style="list-style-type: none"> ○ Liquid and solid media ○ Basic, enriched, differential and selective media ○ Transport media <p>Specimen dealing for culture and susceptibility</p> <ul style="list-style-type: none"> ○ Recommended guidelines for each specimen ○ Clinical laboratory standard institute (CLSI) 	12
4.	<p>Staining techniques used in Microbiology</p> <ul style="list-style-type: none"> ○ Gram stain and its principle ○ ZN stain and its principle ○ Albert's stain 	10

	Common instruments used in Microbiology <ul style="list-style-type: none"> ○ Centrifuges ○ Water bath ○ Incubators ○ ELISA ○ Media pouring machines ○ Automated culture like BACTEC 	
5.	Classification of bacteria and biochemical tests for identification: <ul style="list-style-type: none"> ○ Gram positive bacteria and common biochemical tests ○ Gram negative bacteria and common biochemical tests ○ Analytical profile Index (API) 	10
6.	Microbiology specific Laboratory Management <ul style="list-style-type: none"> ○ 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 <ul style="list-style-type: none"> ○ 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 <ul style="list-style-type: none"> ○ PCR types and procedure ○ DNA/RNA Extractions ○ Restriction Endonucleases ○ Recombinant DNA technology ○ Gel Electrophoresis 	05
10.	<ul style="list-style-type: none"> ○ Research Methodology ○ Biostatistics/Analytical ○ Medical writing/Bioethics 	15
Total		100