AMREF INTERNATIONAL UNIVERSITY
SCHOOL OF MEDICAL SCIENCES
DEPARTMENT OF NURSING & MIDWIFERY SCIENCES
BACHELOR OF SCIENCE IN NURSING (UPGRADING)
END OF JAN-APRIL TRIMESTER EXAMINATIONS 2026

BSN 124: Medical Bacteriology and Mycology

DATE: 8TH APRIL 2026

Duration: 2 HOURS Start: 9:00 AM Finish: 11:00 AM

INSTRUCTIONS

1. This exam is out of **70 Marks**
2. This Examination comprises THREE Sections. Section I: Multiple Choice Questions Section II: Short Answer Questions and Section III: Long Answer Questions
3. Answer ALL Questions.
4. Do not write on the question paper. Use the back of the answer booklet for any rough work

SECTION I: MULTIPLE CHOICE QUESTIONS (20 MARKS)

1. Which statement best distinguishes medical microbiology from general microbiology?
   A. It focuses exclusively on bacteria
   B. It emphasizes host–pathogen interactions and disease outcomes
   C. It excludes laboratory diagnostic techniques
   D. It studies only hospital-acquired infections
2. Joseph Lister's contribution to medical microbiology directly led to:
   A. Vaccine development
   B. Antiseptic surgical practices
   C. Discovery of viruses
   D. Identification of bacterial spores
3. Medical microbiology contributes to patient management by:
   A. Identifying microbes in the environment
   B. Guiding antimicrobial therapy through laboratory diagnosis
   C. Studying microbial genetics only
   D. Monitoring food contamination
4. The absence of a peptidoglycan cell wall is clinically significant because it explains why:
   A. Gram-negative bacteria resist penicillin
   B. Mycoplasma species are resistant to β-lactam antibiotics
   C. Viruses are unaffected by antibiotics
   D. Fungi respond to antibacterial drugs
5. A clinician suspects bacterial meningitis. Which microbiological method provides the fastest preliminary diagnosis?
   A. Culture on blood agar
   B. Polymerase chain reaction (PCR)
   C. Gram staining of cerebrospinal fluid
   D. Serological testing
6. A pathogen shows a small zone of inhibition around an antibiotic disk. This indicates:
   A. High sensitivity
   B. Synergistic activity
   C. Intermediate or resistant response
   D. Laboratory contamination
7. The single most effective measure for preventing nosocomial infections is:
   A. Routine antibiotic prophylaxis

B. Use of personal protective equipment

C. Proper hand hygiene

D. Isolation of all hospitalized patients

8. Failure to adequately process reusable medical equipment most commonly results in:

A. Equipment malfunction

B. Chemical toxicity

C. Transmission of healthcare-associated infections

D. Reduced diagnostic accuracy only

9. The first line of defence against microbial invasion includes:

A. Antibodies

B. Complement system

C. Intact skin and mucous membranes

D. Memory T cells

10. The primary goal of vaccination at the population level is to:

A. Treat infected individuals

B. Eliminate antibiotics

C. Achieve herd immunity

D. Increase pathogen virulence

11. The clinical consequence of widespread antimicrobial resistance is:

A. Reduced need for laboratory diagnosis

B. Shorter hospital stays

C. Limited treatment options and increased morbidity

D. Elimination of opportunistic infections

12. Gram staining remains clinically important because it:

A. Identifies bacterial species

B. Determines bacterial virulence

C. Guides initial empirical antimicrobial therapy

D. Detects viral infections

13. The clinical significance of the bacterial capsule lies in its ability to:

A. Enhance nutrient uptake

B. Increase resistance to phagocytosis

C. Facilitate aerobic respiration

D. Enable sporulation

14. Plasmids are medically important because they often carry genes encoding:
    A. Housekeeping enzymes
    B. Virulence factors and antibiotic resistance
    C. Ribosomal RNA
    D. Metabolic waste products
15. The difference between pathogenicity and virulence is that pathogenicity refers to:
    A. Severity of disease caused
    B. Ability to invade host tissues
    C. Capacity of a micro-organism to cause disease
    D. Toxin production only
16. Broad-spectrum antibiotic therapy most commonly predisposes patients to:
    A. Viral infections
    B. Opportunistic infections
    C. Enhanced immune protection
    D. Reduced microbial resistance
17. Methicillin-resistant *Staphylococcus aureus* (MRSA) is clinically significant primarily because it:
    A. Produces potent exotoxins only
    B. Is resistant to β-lactam antibiotics
    C. Causes disease only in hospitals
    D. Cannot be treated with any antibiotics
18. A key feature that differentiates fungi from bacteria in clinical practice is that fungi:
    A. Are always unicellular
    B. Possess chitin in their cell walls
    C. Lack a nucleus
    D. Are unaffected by antifungal drugs
19. Superficial mycoses are best described as fungal infections that:
    A. Involve deep organs such as lungs and brain
    B. Affect only keratinized tissues without eliciting strong immune responses
    C. Spread via hematogenous dissemination
    D. Occur exclusively in immunocompromised individuals

20. The nodular lesions seen along lymphatic channels in sporotrichosis are best described as:

A. Hematogenous metastases

B. Fixed cutaneous lesions

C. Lymphocutaneous spread

D. Hypersensitivity reactions

SECTION II: SHORT ANSWER QUESTIONS (30 MARKS)

1. explain the importance of microbiology in medical practice (5 Marks)
2. Differentiate between prokaryotic and eukaryotic micro-organisms, giving two examples of each. (5 Marks)
3. Describe the principle of light microscopy and its application in clinical microbiology. (5Marks)
4. Define antimicrobial synergism and explain its clinical importance, giving an example. (5 Marks)
5. Explain how healthcare workers contribute to the transmission of nosocomial infections. (5Marks)
6. Explain Spaulding's classification of medical devices and its importance in infection control. (5Marks)

SECTION C: LONG ANSWER QUESTIONS (20 MARKS)

1. A patient in the ICU develops a systemic fungal infection following broad-spectrum antibiotic therapy. Explain the pathophysiology of systemic mycoses, the risk factors in hospitalized patients, and outline the role of the nurse in early recognition, prevention, and care. (20 Marks)