



*(University of Choice)*

**MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY  
(MMUST)**

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS**

**2021/2022 ACADEMIC YEAR**

**SECOND YEAR END OF TERM ONE  
EXAMINATIONS**

**FOR THE DEGREE  
OF  
BACHELOR OF MEDICINE AND BACHELOR OF  
SURGERY**

**COURSE CODE: MPS 206**

**COURSE TITLE: MEDICAL MICROBIOLOGY AND  
PARASITOLOGY I [MEDICAL BACTERIOLOGY]**

**DATE: 27/04/2022**

**TIME: 8.00-11.00 A.M**

---

**INSTRUCTIONS TO CANDIDATES**

**ANSWER ALL QUESTIONS IN SECTIONS A, B & C.**

**TIME: 3 HOURS**

## SECTION A: MULTIPLE CHOICE QUESTIONS [30 MARKS]

1. Father of Medical Microbiology is:
  - A. Pasteur
  - B. Jenner
  - C. Koch
  - D. A.L.Hock
  - E. Edward Jenner
2. Tuberculosis is a:
  - A. Water borne disease
  - B. Air borne disease
  - C. Food borne disease
  - D. Arthropod borne disease
  - E. None of the above
3. If a person can be infected by direct contact with infected tissue of another person, it is termed as:
  - A. Indirect contact transmission
  - B. Attachment
  - C. Direct contact transmission
  - D. None of these
  - E. B and C
4. The most important virulence factors are:
  - A. Adhesions
  - B. Invasiveness
  - C. Toxigenicity
  - D. All of the above
  - E. A and B
5. Neisseria gonorrhoea is distinguished from Neisseria meningitidis by;
  - A. Both ferment glucose
  - B. Both are oxidase positive
  - C. Both ferment maltose
  - D. Both are diplococci
  - E. None of the above
6. Which of the following characteristics do not occur in prokaryotic cells?
  - A. cellular organization
  - B. thylakoid membranes within chloroplasts
  - C. oxygenic photosynthesis
  - D. anaerobic respiration
  - E. several circular chromosomes
7. Identify the component that is most associated with the induction of septic shock.
  - A. Capsular protein
  - B. Endotoxin
  - C. Peptidoglycan
  - D. Phospholipid

- E. Teichoic acid
8. Swollen lymph nodes and septicaemia is associated with one of the following bacteria:
- A. *Yersinia pestis*
  - B. *Klebsiella ozaenae*
  - C. *Staphylococcus albus*
  - D. *Pasteurella multocida*
  - E. *Escherichia coli*
9. Which of the following cocci-shaped bacteria usually grow in pairs?
- A. *Klebsiella spp*
  - B. *Neisseria spp*
  - C. *Pseudomonas spp*
  - D. *Clostridium spp*
  - E. None of the above
10. *Staphylococcus aureus* releases various types of toxins that increase the virulence of the bacteria, select all the toxins released by *S.aureus*
- A. Aflatoxin
  - B. Mycotoxin
  - C. Leucocidin
  - D. Enterotoxin
  - E. None of these
11. Causative agent for ophthalmic neonatorum is:
- A. *Neisseria meningitidis*
  - B. *Neisseria gonorrhoea*
  - C. *Neisseria catarrhalis*
  - D. *Neisseria mucosa*
  - E. A and C
12. Who accidentally identified the antimicrobial action of penicillin?
- A. Robert Koch
  - B. Richard Petri
  - C. Alexander Fleming
  - D. Louis Pasteur
  - E. Lazzaro Spallanzani
13. Disease that affects many people at different countries is termed as:
- A. Sporadic
  - B. Pandemic
  - C. Epidemic
  - D. Endemic
  - E. A and D
14. The main product of glycolysis under aerobic conditions is:
- A. Pyruvate
  - B. Lactate
  - C. Glucose
  - D. None of these

- E. Both A and B
15. Aesculin hydrolysis demonstrates:
- A. *Streptococcus agalactiae*
  - B. *Streptococcus pneumoniae*
  - C. *Streptococcus faecalis*
  - D. *Streptococcus pyogenes*
  - E. None of the above
16. Virulence of microorganisms is not determined by:
- A. Ability to adhere and colonize
  - B. Host temperature and pH
  - C. Invasiveness
  - D. Ability to evade host defence mechanisms
  - E. None of these
17. Bacteria that grow in 1-10% oxygen are referred to as:
- A. Halophilic
  - B. Facultative
  - C. Psychrophiles
  - D. Microaerophilic
  - E. Anaerobic
18. Which of the following is **NOT** a characteristic of scarlet fever?
- A. Flushed face with circumoral pallor
  - B. Diffuse erythema rash on the neck, trunk and abdomen
  - C. Strawberry tongue
  - D. Rapidly developing pustules that itch
  - E. All of the above
19. Which **ONE** of the following nosocomial pathogens exhibits the widest spectrum of antibiotic resistance?
- A. *Staphylococcus aureus*
  - B. *Escherichia coli*
  - C. *Enterococcus faecalis*
  - D. *Streptococcus pyogenes*
  - E. None of the above
20. Quellung reaction can be used to identify:
- A. *Pseudomonas aeruginosa*
  - B. *Klebsiella pneumoniae*
  - C. *Proteus mirabilis*
  - D. *Salmonella typhi*
  - E. All the above
21. Which **ONE** of the following is NOT a bacterial structure?
- A. Glycocalyx
  - B. Contractile vacuoles
  - C. Babes Ernst granules
  - D. Axial filament

- E. Spore
22. The site most commonly affected by nosocomial infections is:
- A. The gastrointestinal tract
  - B. The genital tract
  - C. The urinary tract
  - D. The respiratory tract
  - E. The skin
23. Penicillase enzyme produced by some bacteria attacks the:
- A. Purine ring of some antibiotics
  - B. Pyrimidine ring of some antibiotics
  - C. Aromatic ring of some antibiotics
  - D.  $\beta$ -lactam ring of some antibiotics
  - E. Ribosomal RNA
24. Identify the **FALSE** statement:
- A. Pathogenic bacteria are destroyed by specific antibodies.
  - B. Pathogenic bacteria may use capsules to evade phagocytosis
  - C. Pathogenic bacteria adhere to host cell surface before invasion.
  - D. Pathogenic bacteria do not compete with normal flora for attachment onto host cell surface.
  - E. All of the above
25. Viridans streptococci normally inhabit the oral cavity and they commonly cause:
- A. Meningitis
  - B. Sub-acute endocarditis
  - C. Otitis
  - D. Media
  - E. Pneumonia
26. The following statements concerning bacterial spores are correct **EXCEPT**:
- A. They are mostly formed by gram-positive rods.
  - B. They are killed by autoclaving
  - C. They contain much less water than vegetative cells.
  - D. Their survival ability depends on their enhanced metabolic activity.
  - E. All the above
27. Bacterial cells can be described to :
- A. Be prokaryotic
  - B. Be Eukaryotic
  - C. Reproduce by meiosis
  - D. Have chitinous cell walls
  - E. None of the above
28. Which of the following statements about UTI is **TRUE**?
- A. UTIs are 10 times more prevalent in women than men.
  - B. More than 90% of all women experience UTI at least once in a lifetime.
  - C. Less than 80% of all UTI cases are due to Escherichia coli.
  - D. Most UTI cases can be protected by vaccination.

- E. A and D
29. The clinical specimen of choice for laboratory diagnosis of diphtheria is
- Blood
  - Cerebrospinal fluid
  - Throat swab
  - Skin scrapings
  - Urine
30. An ideal disinfectant should **NOT**:
- Be fast-acting
  - Be non-toxic to humans
  - Have a residual effect on treated surfaces
  - Be affected by physical agents
  - Volatile

**SECTION B: SHORT ANSWER QUESTIONS [40 MARKS]**

31. Complete the table below:

[5 Marks]

i	Catalase negative cocci	
ii		Is an enriched media
iii	Oxidase positive organism	
iv		Is an example of gram negative diplococci
v		Is a non-lactose fermenting bacteria

32. Outline the characters considered during classification of bacteria [5 Marks]
33. State Koch's molecular postulates [5 Marks]
34. With the aid of a diagram state the growth phases of bacteria in a non-continuous culture broth [5 Marks]
35. State five (5) preventive measures against laboratory infections [5 Marks]
36. Identify the virulence factors produced by *S. aureus* and their role in pathogenesis [5 Marks]
37. Write brief notes on the clinical presentations resulting from the *Bacillus anthracis* infection [5 Marks]
38. Describe the pathotypes of *E. coli* that cause disease in humans [5 Marks]

**SECTION C: LONG ANSWER QUESTIONS [30 MARKS]**

39. Discuss the pathogenesis of tuberculosis [15 Marks]
40. Discuss the disc diffusion technique as used in antibacterial susceptibility testing [15 Marks]