



# MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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## University Examinations 2024/2025

SECOND YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR  
OF MEDICAL MICROBIOLOGY

### HMM 3211: PRINCIPLES OF MEDICAL BACTERIOLOGY

DATE: JANUARY 2025

TIME: 3 HOURS

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#### INSTRUCTIONS:

Answer *All* questions

Ensure that all your answers are properly numbered

Part I multiple Choice Questions (MCQ): Write the correct answer on the space provided in the answer booklet. Each MCQ is one mark

Part II: Short Answer Questions – Answer questions following each other on the answer booklet

Part III: Long Answer Questions – Answer each question on the answer booklet

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#### SECTION A: MULTIPLE CHOICE QUESTIONS (20 marks)

1. Sustainable media for cultivation of *Bordetella pertusis* is
  - a. Chocolate agar
  - b. CLED
  - c. Bordet gengou
  - d. Loeffler slope
2. Natural reservoirs host for *Yersinia pestis* is
  - a. Ticks
  - b. Housefly
  - c. Wild rodents

- d. Man
3. *Brucella abortus*
- a. Cause abortion in man
  - b. Cause abortion in pigs
  - c. Does not cause abortion in man
  - d. Cause undulating fever in man
4. Acetobacilli that cause chancroids is
- a. *Haemophilus influenzae*
  - b. *Streptococcus*
  - c. *Bordetella pertussis*
  - d. *Haemophilus ducreyi*
5. Lowenstein Jensen media is used to isolate
- a. *Streptococcus species*
  - b. *Proteus species*
  - c. *E. coli*
  - d. *Mycobacterium tuberculosis*
6. In Brucellosis 2-mercaptoethanol agglutination test will detect the following antibodies
- a. Igm
  - b. IgE and igm
  - c. IgA
  - d. IgG
7. Which of the following is associated with food poisoning
- a. *Clostridium botulinum*
  - b. *Clostridium tetani*
  - c. *Salmonella typhi*
  - d. *Shigella sonnei*
8. Oxidase is produced by
- a. *Pseudomonas aeruginosa*
  - b. *Staphylococcus saprophitica*
  - c. *Streptococcus pyogenes*

- d. E. coli*
9. Schick test is used to detect the following toxin
- Clostridium toxin
  - Dipteria toxin
  - Salmonella toxin
  - Vibrio toxin
10. Nagler's reaction aids the laboratory in the identification of
- Vibrio cholera*
  - Salmonella typhi*
  - Brucella abortus*
  - Alpha toxin produced by Clostridium perfringens*
11. Double zone of hemolysis on blood agar plate are associated with
- Streptococcus pyogenes
  - Staphylococcus aureus
  - Clostridium perfringens
  - E. coli
12. Bacillus anthracis causes
- Wool sorter disease
  - Typhoid
  - Food poisoning
  - Undulant fever
13. The round terminal spore gives to the organism what has been called a "drum stick appearance" is
- Clostridium botulinum*
  - Clostridium tetani*
  - Bacillus anthracis*
  - Clostridium welchii*
14. Corynebacterium diphtheria
- Is a gram negative
  - Easily decolorized by mineral acids

- c. Exhibits marked pleomorphism in form of Chinese letters
  - d. Form spores
15. Differentiate between staphylococcus and streptococci may be based on
- a. Bile esculin
  - b. Bacitracin sensitivity
  - c. Coagulase reaction
  - d. Catalase reaction
16. Selenite — F broth is a selective enriched medium for which organism
- a. *Salmonella*
  - b. *Proteus*
  - c. *Enterococci*
  - d. *Mycobacterium*
17. Which of the following organism will give a positive reaction for ELEKS test
- a. *Bacillus anthracis*
  - b. *Brucella abortus*
  - c. *Corynebacterium diphtheria*
  - d. *Proteus morganii*
18. The most commonest cause of enteric fever in Kenya is
- a. *Salmonella typhi*
  - b. *Salmonella paratyphi*
  - c. *Salmonella typhimurium*
  - d. *Salmonella enteritidis*
19. Streptococcus pyogenes causes the following infection
- a. Streptococcal sore throat
  - b. Acute glomerulonephritis
  - c. Rheumatic fever
  - d. None of these
20. The most common site of infection with coliforms bacilli is
- a. Upper respiratory tract
  - b. Lower respiratory tract

- c. Urinary tract
- d. Gall bladder

**SECTION B: SHORT ANSWER ALL QUESTIONS (40 MARKS)**

1. Outline the principle behind acid fast staining and the relevance of the test. (5 Marks)
2. Write short notes on extra-pulmonary tuberculosis. (5 Marks)
3. Describe the symptomatology and laboratory diagnosis of chancroid. (5 Marks)
4. Describe haemolytic patterns observed when bacteria are cultured in Blood Agar. (5 Marks)
5. Describe the pathogenesis of invasive non-typhi salmonellosis. (5 Marks)
6. Define a pathogen and distinguish between pathogenicity and virulence. (5 Marks)
7. A 13-year-old female patient presents at the clinic suffering from a urinary tract infection. A sample of midstream urine reveals gram-positive non-encapsulated cocci, which are arranged in clusters and are coagulase negative. Based on the information given, provide an explanation as to which organism you would suspect of causing the infection. (5 Marks)
8. Outline laboratory diagnosis of suspected bacterial pneumonia in an elderly patient. (5 Marks)

**SECTION C: LONG ANSWER TWO QUESTIONS (40 MARKS)**

1. A farmer was pierced by a nail and within a few days he developed anaemia and gas gangrene
  - a) Name the most likely causative organism. (2 Marks)
  - b) Explain systematically how you can isolate and identify the organism (18 Marks)
2. Patient X was brought to you as Laboratory Manager at County Referral Hospital with complains of diarrhea which appeared rice watery and clinically looked dehydrated with sunken eyes:
  - a) What is the aetiological agent? (2 Marks)
  - b) How would you Isolate aetiological agent in your Laboratory (13 Marks)

c) Mention five ways of prevention and control of the disease above: (5 Marks)

3. Write an essay on bacterial meningitis (20 Marks)