



## **MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY**

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### **University Examinations 2024/2025**

#### **THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICAL LABORATORY SCIENCES**

#### **SECOND YEAR FIRST SEMESTER BACHELOR OF MEDICAL LABORATORY SCIENCES**

#### **HML 3313/HMU 3213: MEDICAL BACTERIOLOGY II**

**DATE: JANUARY 2025**

**TIME: 3 HOURS**

##### **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. Which of the following microorganisms is not responsible for urinary tract infection?
  - a) *Proteus mirabilis*
  - b) *Escherichia coli*
  - c) *Klebsiella pneumoniae*

- d) *Bacteroides fragilis*

2. Diarrhea is not caused by

- a) *Shigella dysenteriae*
- b) *Streptococcus pyogenes*
- c) *Clostridium difficile*
- d) *Salmonella enteriditis*

3. Which of the following method can be used to determine the number of bacteria quantitatively?

- a) Spread-plate
- b) Streak-plate
- c) Pour-plate and spread plate
- d) Pour plate

4. *Streptococcus. pneumoniae* produces which of the following type of colonies?

- a) Alpha-haemolytic
- b) Beta-haemolytic
- c) Non-haemolytic
- d) Alpha-, beta-haemolytic

5. Which of the following is the causative agent of dental caries?

- a) *S.pneumoniae*
- b) *S.pyogenes*
- c) *S.mutans*
- d) *S.faecalis*

6. Degree of pathogenicity is referred to as

- a) Infection
- b) Virulence
- c) Avirulent
- d) Attenuated

7. Blood agar medium is

- a) Enrichment medium
- b) Enriched medium
- c) Selective medium
- d) Differential medium

8. The bacterial culture prepared by pure culture method is

- a) Inoculum
- b) Suspension
- c) Dilution
- d) None of these

9. The differentiate lactose and non-lactose fermenters, the medium used is

- a) Wilson & lair
- b) Blood Agar
- c) Tetra thionate broth
- d) MacConkey Agar

10. Lowenstein Jensen media is used to isolate

- a) Streptococcus species
- b) Proteus species
- c) E. coli
- d) Mycobacterium tuberculosis

11. Differentiate between staphylococcus and streptococci may be based on

- a) Bile esculin
- b) Bacitracin sensitivity
- c) Coagulase reaction
- d) Catalase reaction

12. Selenite — F broth is a selective enriched medium for which organism

- a) Salmonella

- b) *Proteus*
- c) *Enterococci*
- d) *Mycobacterium*

13. The most common site of infection with coliforms bacilli is

- a) Upper respiratory tract
- b) Lower respiratory tract
- c) Urinary tract
- d) Gall bladder

14. An outbreak of sepsis caused by *Staphylococcus aureus* has occurred in the newborn nursery. You are called upon to investigate. According to your knowledge of the normal flora, what is the most likely source of the organism?

- a) Nose
- b) Colon
- c) Hand
- d) Throat

15. Streptococcal pneumonia is a disease that affects which part of the body?

- a) urogenital
- b) eyes
- c) gastrointestinal
- d) Upper Respiratory Tract

16. *Streptococcus pneumoniae* and the viridans streptococci can be differentiated by which test?

- a) Optochin disk test
- b) Bacitracin disk test, 0.04 unit
- c) CAMP test
- d) Bile esculin test

17. Ciprofloxacin acts by inhibiting

- a) Cell wall synthesis

- b) RNA synthesis
- c) Folate synthesis
- d) DNA gyrase

18. Each of the following can cause food poisoning except:

- a) *Staphylococcus*
- b) *Clostridium tetani*
- c) *Clostridium Wenchi*
- d) *Clostridium botulinum*

19. The most common mode of cell division in bacteria is

- a) Binary fission
- b) Transverse binary fission
- c) Longitudinal binary fission
- d) None of these

20. Identify the obligate anaerobes

- a) *Salmonella*
- b) *Vibrio cholera*
- c) *Clostridium tetani*
- d) *Aeromonas*

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

1. Describe hemolytic pattern observed when bacteria are cultured in Blood Agar (4 Marks)
2. Enumerate four pathogenic strains of *Escherichia coli*. (5 Marks)
3. Give a step-by-step procedure for differentiation of gram positive from gram negatives (4 Marks)
4. Describe 4 modes of bacterial transmission (4 Marks)
5. Explain any four classes of antibiotics (8 Marks)
6. Define virulence and describe four pathogen factors (4 Marks)

7. Explain various steps involved in the identification of unknown bacteria (5Marks)
8. Name FIVE specimens should normally be sterile (i.e, have no normal flora) (Marks)

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

1. 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) Describe the causative agent for this disease (2 Marks)
  - b) Describe procedure for its isolation and identification (13 Marks)
  - c) Mention five ways of prevention and control of the disease above: (5 Marks)
2. Explain the significance f microbial flora in bacterial infections. Give FIVE examples of vaginal normal flora (20 Marks)