



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

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS**

**2019/2020 ACADEMIC YEAR**

**THIRD YEAR SECOND SEMESTER EXAMINATIONS FOR THE DEGREE OF  
BACHELOR OF MEDICAL LABORATORY SCIENCE**

**COURSE CODE: BML 316**

**COURSE TITLE: Introduction to Medical Bacteriology**

**MAIN EXAMINATION**

**DATE: 11<sup>TH</sup> DECEMBER 2020**

**TIME: 2.00 -4.00PM**

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**INSTRUCTIONS TO CANDIDATES**

Instructions to Candidates  
Answer All Questions

Section A: Multiple Choice Questions (MCQ)	20 Marks.
Section B: Short Answer Questions (SAQ)	40 Marks.
Section C: Long Answer Question (LAQ)	60 Marks

TIME: 2Hours

MMUST observes ZERO tolerance to examination cheating

1. Define pathogenicity
  - a) The ability of the body defense mechanism to eradicate an infection
  - b) The process by which a bacterium is unable to cause disease
  - c) The ability of a bacterium to cause a disease
  - d) The degree of pathogenicity of any bacterial species
2. Which one of the following is most likely to be associated with the formation of a bacterial biofilm?
  - a) Airway colonization in a cystic fibrosis patient with a mucoid (alginate-producing) strain of *Pseudomonas aeruginosa*
  - b) Urinary tract infection with *Escherichia coli*
  - c) Meningitis with *Neisseria meningitidis*
  - d) Tetanus
3. Which type of specimen is suitable to isolate *Salmonella typhi* when you suspect bacteraemia infection?
  - a) Urine
  - b) stool
  - c) blood
  - d) sputum
4. Which one of the following microorganisms can be part of the normal vaginal flora and cause meningitis in newborns?
  - a) *Candida albicans*
  - b) *Corynebacterium* species
  - c) *Staphylococcus epidermidis*
  - d) Group B streptococci
5. Which one of the following drugs inhibit cell wall synthesis, leading to cell lyses.
  - a) cephalosporin
  - b) sulfonamide
  - c) trimethoprim
  - d) clindamycin
6. Which one of the following species appears in pairs in a gram staining procedure results?
  - a) *Neisseria species*
  - b) *Staphylococcus species*
  - c) *Streptococcus species*
  - d) *Epidermidis species*
7. Which one of the following statements is true about the color of *Salmonella* colonies on macConkey medium?
  - a) Colonies appear mucoid and yellow
  - b) Colonies appear green
  - c) Colonies appear pink and mucoid
  - d) Colonies appear pale green and mucoid
8. Which one of the following anti-microbial drugs does not inhibit protein synthesis?
  - a) Tetracycline
  - b) Erythromycin
  - c) Chloramphenicol
  - d) Quinolones
9. Long-term carriage and shedding is most likely to occur after gastrointestinal infection with which of the following species?
  - a) *Escherichia coli* O157:H7
  - b) *Vibrio cholerae*
  - c) *Campylobacter jejuni*
  - d) *Salmonella typhi*
10. TSI (triple sugar iron) medium is a highly differential media for identification of gram -ve rods (bacilli). What is the result interpretation of Red/Yellow (slant/butt) with bubbles and black precipitate?
  - a) Glucose fermentation only, Gas production, H<sub>2</sub>S production.
  - b) Glucose and lactose and/or sucrose fermentation, Gas production.
  - c) Glucose and lactose and/or sucrose fermentation
  - d) No fermentation but peptone utilization with gas production
11. Dental plaque and periodontal disease can be thought of as a continuum of what type of physiological process?
  - a) Biofilm formation
  - b) Normal aging
  - c) Abnormal digestion
  - d) Exaggerated immune response

12. Which one of the following is a danger of indiscriminate use of antimicrobial drugs?
  - a) The drug destroying and changing abnormal microbial flora leading to “super infection” due to over growth of drug-resistant micro-organism.
  - b) Wide spread sensitization resulting in hypersensitivity and anaphylactic reaction, and drug rashes.
  - c) Direct and fast recovery of heart and auditory nerve damage due to aminoglycosides toxicity
  - d) unmasking the pathogen
13. Which of the following techniques would be most useful in identifying isolates from a culture?
  - a) Ribotyping
  - b) 18S rRNA sequencing
  - c) Antimicrobial susceptibility testing
  - d) Nucleic acid sequencing
14. The growth rate of bacteria during the exponential phase of growth is
  - a) Zero
  - b) Increasing
  - c) Constant
  - d) Decreasing
15. Which of the following is NOT a mechanism for generating metabolic energy by microorganisms?
  - a) Fermentation
  - b) Protein synthesis
  - c) Respiration
  - d) Photosynthesis
16. The growth rate of bacteria during the maximum stationary phase of growth is
  - a) Zero
  - b) Increasing
  - c) Constant
  - d) Decreasing
17. The action of which of the following agents or processes on bacteria can be reversed?
  - a) A disinfectant
  - b) A bactericidal agent
  - c) A bacteriostatic agent
  - d) Autoclaving at 121°C for 15 minutes
18. Which one of the following describes the results of no fermentation but peptone utilization in a TSI medium
  - a) Red/Red (slant/butt)
  - b) Yellow/Yellow (Acid /Acid) with bubbles
  - c) Red/Yellow (Alkaline/Acid) with bubbles
  - d) Yellow/Yellow (Acid /Acid)with bubbles
19. Which one of the following describes the results of glucose fermentation only and peptone utilization
  - a) Red/Yellow (slant/butt)
  - b) Red/Red (slant/butt)
  - c) Yellow/Yellow (Acid /Acid) with bubbles
  - d) Red/Yellow (Alkaline/Acid) with bubbles
20. An unculturable gram-positive microorganism has been visualized in tissue specimens obtained from patients with a previously undescribed disease. Which of the following techniques would be most useful in identifying this organism?
  - a) Serology
  - b) PCR amplification and sequencing of rRNA genes
  - c) Multilocus enzyme electrophoresis
  - d) SDS-polyacrylamide gel electrophoresis

Section B: Short Answer Questions (SAQ)

40 Marks.

1. Outline the difference between endotoxins and exotoxins ( 4mks)
2. State and explain the bacterial growth phases (4 mks)
3. Explain the chemical methods of sterilization ( 4mks)
4. State and describe the various classes of media ( 4mks)
5. Outline aseptic technique observed during inoculation of culture media(4mks)
6. State the aggressive mechanisms of the parasite to a host (4mks)
7. Outline 4 general methods of staining bacteria (4mks)
8. Differentiate between a mordant and an accentuator (4mks)
9. Define host-parasite relationship and how this can be classified on the basis of their habits (4 mks)

10. Salmonella /shigella (ss) agar medium is a highly selective medium for the recovery of *Salmonella and Shigella Spps.*  
State the bile salts included in this medium and their importance(4mks)

Section B: Long Answer Questions (LAQ)

40 Marks

1. Discuss the mode of action of antimicrobial agents and Citing relevant examples describe the mechanisms of drug resistance in bacteria (20 marks)
2. Discuss the importance of the common ingredients of culture media (20mks)
3. Discuss common microbial biochemical tests used to differentiate among bacteria (20mks)