



**COLLEGE OF HEALTH, AGRICULTURE & NATURAL SCIENCES
DEPARTMENT OF HEALTH SCIENCES
BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS**

**SLS 204 BACTERIOLOGY THEORY
END OF FIRST SEMESTER EXAMINATIONS**

NOVEMBER 2018

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DURATION: 3 HOURS

INSTRUCTIONS

The paper comprises of three sections (A, B and C).

Section A (40 marks)

Answer all questions in this section.

Circle the correct answer

Each correct answer (whether **True (T)** or **False (F)**) carries $\frac{1}{4}$ mark.

Section B (20 marks)

Answer all questions in this section.

Section C (60 marks)

Choose **three** questions. The whole section is out of 60.

Credit will be given for logical, systematic and neat presentations.

SECTION A: TRUE (T) OR FALSE (F) QUESTIONS [40 MARKS]

1. What groups listed below have true cell walls?

- T F A. mycoplasmas
- T F B. Gram-positive bacteria
- T F C. fungi
- T F D. protozoans

2. Identify which statements are correct.

- T F A. All bacteria have peptidoglycan in their cell walls.
- T F B. All fungi have chitin in their cell walls.
- T F C. All algae have cellulose in their cell walls.
- T F D. All protozoans have protein in their cell walls.

3. The bacterial cytoplasmic membrane contains:

- T F A. Ester-linked phospholipids, but no sterols
- T F B. Ester-linked phospholipids and sterols
- T F C. Ether-linked phospholipids, but no sterols
- T F D. Ether-linked phospholipids, sulfolipids, and glycolipids

4. Which compounds produced by microorganisms can cause fever in humans and can withstand autoclaving?

- T F A. Endotoxin
- T F B. Lipid A
- T F C. Lipopolysaccharide
- T F D. Peptidoglycan

5. Which of the following diseases and bacteria are matched up incorrectly?

- T F A. Gastritis - *Helicobacter pylori*
- T F B. Lyme disease - *Yersinia pestis*
- T F C. *Treponema pallidum* - Syphilis
- T F D. *Borrelia burgdorferi* - Lyme disease

6. Which of the following is not true concerning *Staphylococcus aureus*?

- T F A. *S. aureus* is related to inflammation.
- T F B. *S. aureus* can cause pneumonia
- T F C. *S. aureus* can lead to acute bacterial endocarditis
- T F D. *S. aureus* does not make coagulase

7. Which of the following media is used for culturing Salmonella?

- T F A. VL-broth
- T F B. Sabouraud agar
- T F C. Slanetz Bartley
- T F D. Selenite Broth

8. Choose the correct statement about Antigen detection:

- T F A. It is an indirect method
- T F B. Negative result means presence of microbe in the patient's body
- T F C. It is carried out in the laboratory using antibodies of animal origin
- T F D. Uses a sample of patients saliva

9. Chocolate agar is an example of a pure enriched medium used for culturing:

- T F A. Streptococci
- T F B. Hemophili
- T F C. Enterococci
- T F D. Tuberculous bacilli

10. Optochin is used to test:

- T F A. Lactose fermentation
- T F B. Motility
- T F C. Glucose fermentation
- T F D. Antibiotic susceptibility

11. Löwentein-Jensen medium is used for culturing:

- T F A. Enterobacteria
- T F B. Tuberculosis
- T F C. Salmonella
- T F D. G+ bacteria

12. Choose the incorrect statement about E-tests

- T F A. The testing strip has a rising Atb concentration
- T F B. The test is qualitative
- T F C. The strip has a scale
- T F D. Principally similar to diffusion disc test

13. The MIC Value is:

- T F A. The highest concentration that inhibits growth
- T F B. The highest concentration that allows growth
- T F C. The lowest concentration that inhibits growth
- T F D. The lowest concentration that inhibits growth

14. Haemagglutination Inhibition Test:

- T F A. Is not an agglutination reaction
- T F B. Is a neutralisation reaction
- T F C. Result with a dense round target is positive

T F D. All answers are correct

15. In the first phase of PCR reaction:

T F A. We have to find isolated DNA

T F B. Product is initially detected

T F C. We have to amplify the DNA

T F D. None of the answers are correct

16. Catalase test is used for:

T F A. Diagnostics of G+ cocci

T F B. Diagnostics of G+ rods

T F C. Uses hydrogen peroxide

T F D. All answers are correct

17. Indol test positivity is indicated by presence of:

T F A. A red ring

T F B. Colour change to yellow

T F C. Colour change to blue

T F D. Increased turbidity

18. Which of the following microorganisms has not been linked to UTI's?

T F A. coli

T F B. Pseudomonas

T F C. Klebsiella

T F D. Haemophilus

19. Which of the following signs and symptoms is not linked to Haemophilus influenzae?

T F A. Otitis media

T F B. Pneumonia

T F C. Malaria

T F D. Epiglottitis

20. Which of the following is not true related to endotoxins?

T F A. Endotoxins are secreted from cells.

T F B. Can be linked to Meningococcemia

T F C. Produced by gram negative microorganisms

T F D. Can cause fever

21. Which of the following microorganisms stain well?

T F A. Escherichia coli

T F B. Legionella pneumophila

T F C. Treponema

T F D. Chlamydia

22. Which of the following microorganisms are not matched correctly with the appropriate isolation media?

- T F A. *Vibrio cholerae* – TCBS media
- T F B. *Neisseria gonorrhoeae* - Pink colonies media
- T F C. *Haemophilus influenzae* - Chocolate agar
- T F D. *Mycobacterium tuberculosis* - Lowenstein-Jensen agar
23. Which of the following structures contains genes for enzymes and antibiotic resistance?
- T F A. Plasmid
- T F B. Pilus
- T F C. Capsule
- T F D. Plasma Membrane
24. Which of the following is the most important structure related to microbial attachment to cells?
- T F A. Flagellum
- T F B. Plasmid
- T F C. Peptidoglycan
- T F D. Glycocalyx
25. Which of the following is not a gram-negative bug?
- T F A. *Clostridium perfringens*
- T F B. *Vibrio cholerae*
- T F C. *Escherichia coli*
- T F D. *Bordetella pertussis*
26. The cell wall of gram-positive bacteria may contribute to the development of septic shock. Identify the component which is most associated with the induction of septic shock.
- T F A. Endotoxin
- T F B. Peptidoglycan
- T F C. Phospholipid
- T F D. Teichoic acid
27. The following areas of the human body are normally sterile
- T F A. small intestines
- T F B. mouth
- T F C. skin
- T F D. vagina
28. The gram-negative organism(s) is/are
- T F A. *Actinomyces*
- T F B. *Bacillus*
- T F C. *Clostridium*
- T F D. None of these
29. Which of the following bacteria lack a cell wall and are therefore resistant to penicillin?
- T F A. Cyanobacteria
- T F B. Mycoplasmas
- T F C. *Vibrio cholerae*

T F D. Spirochetes

30. The identification of bacteria by serologic tests is based on the presence of specific antigens. Which of the following bacterial components is least likely to contain useful antigens?

T F A. Capsule

T F B. Cell wall

T F C. Flagella

T F D. Ribosomes

31. Each of the following organisms is an important cause of urinary tract infections except:

T F A. *Klebsiella pneumoniae*

T F B. *Escherichia coli*

T F C. *Bacteriodes fragilis*

T F D. *Proteus mirabilis*

32. Each of the following agents is a recognized cause of diarrhea except

T F A. *Clostridium perfringens*

T F B. *Vibrio cholerae*

T F C. *Enterococcus faecalis*

T F D. *Escherichia coli*

33. Which of the following bacteria has the lowest 50% infective dose (ID₅₀)?

T F A. *Campylobacter jejuni*

T F B. *Salmonella typhi*

T F C. *Vibrio cholerae*

T F D. *Shigella sonnei*

34. Which of the following disease is best diagnosed by serologic means?

T F A. Pulmonary tuberculosis

T F B. Gonorrhea

T F C. Actinomycosis

T F D. Syphilis

35. A patient develops explosive, watery diarrhea 24 hours after eating seafood. What bacterium is most likely involved?

T F A. *Campylobacter fetus*

T F B. *Salmonella typhimurium*

T F C. *Shigella flexneri*

T F D. *Vibrio cholerae*

36. Which of the following bacteria is not a most common bacterial pathogen causing diarrhea?

T F A. *Shigella* spp

T F B. *Salmonella* spp

T F C. *Enterococcus faecalis*

T F D. *Campylobacter* spp

37. Which of the following bacteria is rarely associated with urinary tract infections?

T F A. *coli*

T F B. *Enterobacter* spp

T F C. *Proteus* spp

T F D. *Shigella* spp

38. Which of the following Gram negative rod is not a blood borne bacterial pathogen?

T F A. *Shigella* spp

T F B. *Escherichia coli*

T F C. *Klebsiella pneumoniae*

T F D. *Pseudomonas aeruginosa*

39. Which of the following bacteria causing sexually transmitted disease cannot be grown on artificial media?

T F A. *Neisseria gonorrhoeae*

T F B. *Chlamydia trachomatis*

T F C. *Treponema pallidum*

T F D. *Treponema pallidum* and *Chlamydia trachomatis*

40. The staphylococcal intoxication refers to presence of

T F A. an enterotoxin

T F B. neurotoxin

T F C. mycotoxin

T F D. All of these

SECTION B: SHORT ANSWERS [20 MARKS]

Answer all questions in this section

B1. Write principles of the following biochemical tests and give examples

(i). Catalase test (2)

(ii). Indole test (3)

(iii). Citrate test (2)

(iv). Bound and free coagulase test (3)

B2. Explain which media you would use to isolate the following bacteria and why

(i). *Vibrio cholera* (2)

(ii). *Streptococcus pyogenes* (2)

- (iii). *Neisseria gonorrhoeae* (2)
- (iv). *Staphylococcus pyogenes* (2)
- (v). *Haemophilus influenza* (2)

SECTION C: SHORT ANSWERS [60 MARKS]

Choose three questions in this section

- C1. Write short notes on bacterial endotoxins and exotoxins (20)
- C2. Discuss the different media types with examples (20).
- C3. Write short notes on bacterial virulence factors (20).
- C4. Describe the bacterial aetiology of the urinary tract infection (UTI) (20).
- C5. Describe the bacterial aetiology of meningitis (20).