Candidate number:…….

"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE & NATURAL SCIENCES

DEPARTMENT OF BIOMEDICAL AND LABORATORY SCIENCES

BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS

NSLS 204 BACTERIOLOGY THEORY EXAMINATION

END OF SEMESTER EXAMINATIONS

NOVEMBER 2022

LECTURER: MR G.B HLEREMA

DURATION: 3 HOURS

INSTRUCTIONS

- **The paper comprises of three sections (A, B and C).**
- **Write your candidate number in the spaces provided**

Section A (20 marks)

Answer all questions in this section.
Circle the correct answer

Section B (20 marks)
Answer all questions in this section.

Section C (60 marks)
Choose **three** questions. Credit will be given for logical, systematic and neat presentations.

Candidate number:…….

SECTION A: CIRCLE THE CORRECT ANSWER [20 MARKS]

1. A cluster of polar flagella is called

A. lophotrichous

B. amphitrichous

C. monotrichous

D. petritrichous

2. Flagella move the cell by

A. many flagella beating in a synchronous, whip-like motion

B. an individual flagellum beating in a whip-like motion

C. spinning like a propeller

D. attaching to nearby particles and contracting

3. Peptidoglycan accounts for _____ of the dry weight of cell wall in many gram positive bacteria.

A. 50% or more

B. About 10%

C. 11%+ 0.22%

D. About 20%

4. Which of the following is true about cell wall of gram-positive bacteria?

A. It consists of multiple layers

B. It is thicker than that associated with gram-negative bacteria

C. It contains teichoic acids

D. All of these

5.The organism which obtain their energy from chemicals are designated as

A. prototrophs

B. chemotrophs

C. organotrophs

D. autotrophs

6. The organism which grows best above 45°C are called

A. psychrophilic
B. mesosphilic
C. thermophilic
D. any of these

7. Which of the following is/are not a gram-positive bacteria?

A. Streptococci
B. Pseudomonas
C. Mycobacteria
D. None of these

8. Which of the following is used for the proper maintenance and preservation of pure cultures?

A. Periodic transfer to fresh media
B. Preservation by overlaying cultures with mineral oil
C. Preservation by lyophilization
D. All of the above

9. Catalase production is negative in which of the following?

A. Streptococcus
B. Salmonella
C. Proteus
D. Staphylococcus

10. The production of sufficient acid by fermentation of glucose leads to decrease in pH such that pH of the medium falls below 4.5. Which of the following test can detect it?

A. Indole test
B. Methyl red test
C. Citrate utilization test
D. Voges-Proskauer test

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TRUE (T) OR FALSE (F) QUESTIONS CIRCLE THE CORRECT ANSWER [10 MARKS]

11. The coagulase test is used to differentiate

T F A. Staphylococcus epidermidis from Neisseria meningitidis
T F B. Staphylococcus aureus from Staphylococcus epidermidis
T F C. Streptococcus pyogens from Staphylococcus aureus
T F D. Streptococcus pyogens from Enterococcus faecalis

12. The role of bacterial capsules as virulence factors is usually related to their ability to interfere with

T F A. Antibody binding
T F B. Antibacterial penetration of bacterial cells
T F C. Phagocytosis
T F D. The release of interferon gamma and other macrophage activating cytokines

13. The molecular basis for the effect of cholera toxin on duodenal mucosal cells is

T F A. Activation of adenylate Cyclase
T F B. increased generation of cyclic adenosine monophosphate (cAMP)
T F C. Ribosylation of a guanosine triphosphate (GTP) binding protein.

14. 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 cholera

15. 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

16. Which of the following bacteria is the most important cause of acute bacterial meningitis?

T F A. Neisseria menigitidis
T F B. Streptococcus pneumoniae
T F C. Haemophilus influenzae
T F D. Streptococcus pyogens

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SECTION B: SHORT ANSWERS [20 MARKS]

Answer all questions in this section

B1. (i) Name the space found between inner membrane and outer membrane in gram negative bacterial cell wall and state its function. (3)

B2. Tuberculosis (TB) is an important infectious disease in sub Saharan Africa.

Which organism causes TB? (1)

What virulence factors are associated with the pathogenicity of the causative aotganism (3)

Explain the structure of the cell wall for the causative organism (6)

B3 Write principles of the following biochemical tests and give examples

Urease (2)

Indole test (3)

Catalase (2)

SECTION C: SHORT ANSWERS [60 MARKS]

Choose three questions in this section

1. Describe the following terms used in bacteriology

a) (i) Gram stain(ii)Endospore (iii) Bacteriophage (iv) Plasmid (v) Conjugation (15)

b) What contribution was made by Antoni Van Leeuwenhoek and Robert Koch to the world of bacteriology? (5)

2. Write an essay on culture media, explaining the uses of different types of culture media in bacteriology (20).

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3. What you understand by bacterial toxins? (20).

4. Describe the steps you would take to investigate the etiology of wound infection from a wound swab (20).

5**.** Describe the steps you would take to investigate the etiology of bacterial pneumonia from a throat swab (20)