

NATIONAL UNIVERSITY OF LESOTHO

FACULTY OF HEALTH SCIENCES

DEPARTMENT OF PHARMACY

PHA 3304: CLINICAL MICROBIOLOGY

Supplementary examinations

August 2023

100 MARKS

3HRS

Instructions:

- The paper consists of **five (5) printed pages** including the **cover page**
- Answer **all** the questions
- Begin every question on a **NEW PAGE**

SECTION A - **40 marks**

SECTION B - **60 marks**

SECTION A**40 MARKS****QUESTION ONE****10 MARKS**

1. Which of the following are harmful effects of microbes?
 - A. Making life-saving drugs
 - B. Causing infections to humans
 - C. Making food and alcoholic beverages through fermentation
 - D. Making solvents for industrial purposes

2. Which of the following is a correct match for bacteria with corresponding stain properties?
 - A. Acid-fast stains >>>>>>> *Mycobacterium tuberculosis*
 - B. Gram positive >>>>>>> *Salmonella typhi*
 - C. Gram negative >>>>>>> *Streptococcus pneumonia*
 - D. Spore stains >>>>>>> *Mycobacterium tuberculosis*

3. What is the difference between Gram negative and Gram positive cells?
 - A. Peptidoglycan thickness: Gram negative > Gram positive
 - B. Presence of lipopolysaccharides: Gram negative(low), Gram positive (none)
 - C. Presence of teichoic acid: Gram negative(absent), Gram positive (present)
 - D. Periplasmic space: Gram negative(present), Gram positive (absent)

4. Which phase in a bacterial cell growth curve does rate of proliferation equates to cell death?
 - A. Lag
 - B. Log
 - C. Decline
 - D. Stationery

5. Which of the following statement is true about fungi?
 - A. Bacteria do not contain sterols in their membranes; with exceptions
 - B. Fungal cell membrane has lipids, glycoproteins and ergosterol
 - C. Unlike bacteria, fungi are prokaryotes
 - D. Filamentous fungi form pseudo-hyphae

6. Which of the following is the correct match for protozoal classification?
 - A. Amoebae >>>>>> *E. histolytica*
 - B. Flagellates >>>>> *T. gondii*
 - C. Ciliophora >>>>> *Plasmodium spp.*
 - D. Coccidia >>>>>> *Balantidium coli*

7. Which of the following worms are flat, leaf-shaped with oral muscular sucker?
 - A. Roundworms
 - B. Flukes
 - C. Tapeworms
 - D. Guinea worms

8. In a viral growth cycle, which of the process take place on the host DNA?
 - A. Uncoating
 - B. Translation
 - C. Transcription
 - D. Assembly

9. Which of the following statements define opportunistic pathogens?
 - A. Cause disease under favourable circumstances
 - B. Can cause disease upon infection
 - C. Present but symptoms are not there; the disease can appear after some time
 - D. Commensal to the host while the host's immune system is still fully functioning

10. Which one of the following is third line of defence against infection?
 - A. Acquired immunity
 - B. Fever
 - C. Inflammation
 - D. Phagocytosis

QUESTION TWO

30 MARKS

State whether the following statements are true or false.

- 1) Blinking and tear production (lacrimation) to flush the eye's surface with tears make part of second line of defense
- 2) Vaginal secretions provide cleansing of the lower reproductive tract in males
- 3) *E. coli* resides mainly in the colon; as intestinal flora
- 4) Both first and second line of defenses are non-specific defense mechanisms
- 5) Phagocytosis, fever and inflammation are second line of defenses
- 6) Fever is an adjunct to inflammation
- 7) Microbes have many mechanisms for successfully overcoming or avoiding our first and second lines of defense
- 8) Vancomycin is usually effective for methicillin-resistant staphylococci

- 9) *Listeria monocytogenes* survives pasteurization of milk, cheese-making and refrigeration
- 10) There is no synergistic activity between penicillins and aminoglycosides on eradicating bacterial infections
- 11) Tetanus toxoid vaccine used to prevent tetanus from *C. difficile*.
- 12) *E. coli* is a member of skin flora but can cause traveller's diarrhea
- 13) Improperly cooked marine food can transmit *V. cholerae* infections
- 14) Proper water and sanitation treatment is a preventive measure for *Helicobacter pylori* infections
- 15) *Helicobacter pylori* gastritis is eradicated with three antibiotics namely omeprazole, amoxicillin and metronidazole
- 16) *P. aeruginosa* is a gram positive organism that causes severe septicaemia
- 17) Gram staining cannot be used to classify Mycobacteria due to cell wall differences with typical bacteria
- 18) TB infection is easy to acquire but it takes a long time to become a TB disease in a person
- 19) *Aspergillus spp.* are environmental fungi, while *Candida spp.* are normal flora
- 20) Long term usage of inhaled corticosteroids is a risk factor to respiratory *Aspergillus* infections
- 21) Local imidazoles or nystatin are used for local infections, ketoconazole for chronic mucocutaneous candidiasis
- 22) *Cryptococcus neoformans* is an opportunistic pathogen in HIV/AIDS and causes meningitis
- 23) Fluconazole is used for long-term prophylaxis in the immunocompromised patient for cryptococcal meningitis, particularly in AIDS
- 24) Lice are both reservoirs for microbes and can cause infections of their own
- 25) *T. vaginalis* is a member of STI causing microorganisms together with *N. gonorrhoeae* and *T. pallidum*
- 26) Partner treatment and condom use help control transmission of most STIs
- 27) Mass administration of albendazole help prevent worm infestation endemic
- 28) Proper cooking of beef, pork and fish is key to preventing fluke infestations

29) Trematodes depends on host for reproductive system

30) Coronaviruses are viruses that multiply in the gut but cause respiratory infections

SECTION B

60 MARKS

QUESTION ONE

30 MARKS

Discuss the pathogenesis of the following infections **5 marks each**

- a) Acute diarrhea
- b) Rheumatic fever
- c) Septic shock
- d) Food poisoning
- e) Tuberculosis
- f) Meningitis

QUESTION TWO

30 MARKS

a) The effects of antimicrobials is a double-edged sword; likewise with the normal flora.

Discuss the statement (1 mark per point)

5 marks

b) **Compare and contrast** between bacteria and fungi in terms of cellular elements (1 mark per point)

5 marks

c) **Characterize** *S. aureus* in terms of shape, stain, gas requirements and specialized features (1 mark per point)

5 marks

d) Should fever and cough be treated; although they form 1st and 2nd line of body defense against infections? **Explain your view** (1 mark per point)

5 marks

e) **Discuss** why is PCP treated with antibacterials yet it's a fungi **5 marks**

f) *Helicobacter pylori* is a major contributing factor to developing gastric ulcers; discuss **5 marks**

g) Compare and contrast between HIV and Hepatitis B

5 marks