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University Examinations 2023/2024

FIRST YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF SCIENCE IN MEDICAL LABORATORY AND BACHELOR OF SCIENCE IN
MEDICAL MICROBIOLOGY

HML 3123/HMM 3121: INTRODUCTION TO MICROBIOLOGY

DATE: APRIL 2024

TIME: 2 HOURS

INSTRUCTIONS:

- (i) The paper consists of **Three** Sections
 - (ii) Section A: Multiple Choice Questions (Answer all questions)
 - (iii) Section B: Short Answer Questions (Answer all questions)
 - (iv) Section C: Long Answer Questions (Choose any Two questions)
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1. What is the general characteristic shared by bacteria, fungi, and viruses?
 - a) They are all eukaryotic organisms
 - b) They are all multicellular organisms
 - c) They are all prokaryotic organisms
 - d) They are all parasites
 2. Which of the following is not a growth phase in bacterial culture?
 - a) Lag phase
 - b) Stationary phase
 - c) Death phase
 - d) Dormant phase
 3. In bacteriology, what is agar commonly used for?
 - a) Nutrient source
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- b) Providing a solid surface for colony growth
 - c) pH buffering
 - d) Oxygen supply
4. What is the primary method used for the isolation and identification of bacteria in the laboratory?
- a) Gram staining
 - b) Culture
 - c) Enzyme-Linked Immunosorbent Assay
 - d) Electron microscopy
5. Which of the following is an example of a mycological structure?
- a) Capsid
 - b) Chitin
 - c) Flagellum
 - d) Ribosome
6. What is the primary site of replication for viruses within host cells?
- a) Nucleus
 - b) Cytoplasm
 - c) Endoplasmic reticulum
 - d) Golgi apparatus
7. Which the of the following is a characteristic of bacterial classification based on morphological characteristic?
- a) Gram rea
 - b) Viral envelope presence
 - c) RNA structure
 - d) Capsid shape
8. What is an economic importance of microorganisms?
- a) Destruction of crops
 - b) Production of antibiotics
 - c) Creation of antibiotic resistance
 - d) Decrease in food spoilage
9. How do fungi primarily obtain nutrition?

- a) Absorption
 - b) Photosynthesis
 - c) Ingestion
 - d) Chemotrophy
10. What is a common method for the isolation of fungi from environmental samples?
- a) PCR amplification
 - b) Blood agar plate culture
 - c) Sabouraud dextrose agar culture
 - d) Direct visualization under a microscope
11. Which of the following is not a stage in the life cycle of fungi?
- a) Spore formation
 - b) Conjugation
 - c) Germination
 - d) Budding
12. Which of the following is a structural characteristic of viruses?
- a) Cell wall
 - b) Plasma membrane
 - c) Capsid
 - d) Nucleus
13. Which of the following is a common method for culturing viruses in the laboratory?
- a) Blood agar plates
 - b) Tissue culture
 - c) MacConkey agar plates
 - d) Sabouraud dextrose agar plates
14. In virology, what is the role of a vector in transmission?
- a) Host organism
 - b) Carrier organism
 - c) Primary infection site
 - d) Replication site
15. Which of the following is a characteristic symptomology associated with bacterial infections?

- a) Inclusion bodies
 - b) Antibiotic resistance
 - c) Plasmolysis
 - d) Fever
16. What is the primary structural component of bacterial cell walls?
- a) Chitin
 - b) Peptidoglycan
 - c) Cellulose
 - d) Glycogen
17. Which of the following is a characteristic shared by all bacteria, fungi and viruses?
- a) Cell wall made of peptidoglycan
 - b) Presence of ribosomes
 - c) Ability to undergo mitosis
 - d) Nucleus containing DNA
18. What is the primary difference between bacterial and fungal growth on agar plates?
- a) Bacterial growth forms colonies, while fungal growth forms hyphae.
 - b) Fungal growth forms colonies, while bacterial growth forms hyphae.
 - c) Bacterial growth is always pigmented, while fungal growth is not.
 - d) Fungal growth requires anaerobic conditions, while bacterial growth does not.
19. Which of the following is not a characteristic of viruses?
- a) Independent metabolism
 - b) Obligate intracellular parasites
 - c) Possession of genetic material
 - d) Ability to evolve
20. What is the primary mode of transmission of fungal infections?
- a) Inhalation of spores
 - b) Vector-borne transmission
 - c) Sexual contact
 - d) Direct contact with infected individuals

SECTION B SHORT ANSWER QUESTIONS (40 MARKS)

1. Describe the viral proteins (5 marks)
2. Outline the cell wall structure of an acid-fast bacteria (5 marks)
3. List the harmful effects of fungi (6 marks)
4. Describe the diagnostic approaches for fungal infections (6 marks)
5. Using a graph, describe the bacterial growth curve (8 marks)
6. Describe viral release in the virus replication cycle (4 marks)
7. Describe classification of bacterial media based on their ingredients (6 marks)

SECTION C: LONG ANSWER QUESTIONS -Answer any 2 (20 marks each)

QUESTION ONE

Discuss special medias in bacteriology (20 marks)

QUESTION TWO

Discuss classification of fungi based on sexual reproduction (20 marks)

QUESTION THREE

- a) Describe the structure of a virus (5 marks)
- b) Describe the key elements in virus-host interaction (10 marks)
- c) Describe the basis for viral classification (5 marks)