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*(University of Choice)*

# MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

## MAIN CAMPUS

## UNIVERSITY EXAMINATIONS (MAIN PAPER)

## 2023/2024 ACADEMIC YEAR

## THIRD YEAR FIRST SEMESTER EXAMINATIONS

## FOR THE DEGREE OF BACHELOR OF SCIENCE IN MEDICAL LABORATORY SCIENCE

**COURSE CODE:** BML 314:

**COURSE TITLE:** SYSTEMIC VIROLOGY

**DATE:** 6TH DECEMBER 2023 **TIME:** 2.00- 4.00PM

**INSTRUCTIONS TO CANDIDATES**

This paper is divided into three sections, **A B** and **C,** respectively: Multiple Choice Questions (**MCQs**), Short Answer Questions (**SAQs**) and Long Answer Questions (**LAQs**). Answer all questions. **DO NOT WRITE ON THE QUESTION PAPER**

**TIME:** 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 4 Printed Pages. Please Turn Over

**SECTION A: Multiple Choice Questions (20 Marks)**

1. Where did the term "virus" originate from?
   A. Latin word for obligate particles
   B. Latin word for "slimy liquid or poison".
   C. Greek word for "invisible particle"
   D. French word for "microscopic organism".

2. Invention of the Chamberland filter, which had pores smaller than bacteria was made by--------
   A. Louis Pasteur
   B. Frederick Twort
   C. Charles Chamberland
   D. Félix d'Herelle

3. Live vaccines are used to protect against the following viruses except----------
   A. Rotavirus
   B. Smallpox
   C. Hepatitis A
   D. Yellow fever

4. Tobacco Mosaic Disease was discovered by _____ in 1876
   A. Frederick Twort
   B. Louis Pasteur
   C. Charles Chamberland
   D. Adolf Mayer

5. Which type of transduction involves the transfer of random pieces of bacterial chromosomal DNA during the lytic cycle of viral replication?
   A. Generalized transduction
   B. Specialized transduction
   C. Conjugative transduction
   D. Homologous recombination

6. How is hepatitis B primarily transmitted?
   A. Through respiratory droplets
   B. By consuming contaminated food or water
   C. Parenterally, sexually, or from mother to baby
   D. Through casual contact with infected individuals

7. Louis Pasteur was unable to find a causative agent for which disease, speculating about a pathogen too small to be detected using a microscope?
   A. Influenza
   B. Tuberculosis
   C. Rabies
   D. Smallpox

8. What is the role of reverse transcriptase in retroviruses like HIV?
   A. It helps in replicating the viral RNA genome.
   B. It synthesizes a complementary single-stranded RNA copy from DNA genome
   C. It synthesizes a complementary single-stranded DNA copy from the viral RNA genome.
   D. It integrates the viral genome into the host chromosome.

9. What is the primary function of the nucleic acid core in a virus?
   A. Inducing neutralizing antibodies
   B. Protecting the viral genome from nucleases
   C. Enhancing the efficiency of infection
   D. Controlling the host specificity

10. Which component of a virus determines host specificity?
   A. Nucleic acid core
   B. Capsid
   C. Matrix Protein
   D. Envelope

11. Why is the envelope essential for the infectivity of enveloped viruses?
   A. It protects the viral genome from degradation.
   B. It determines host specificity.
   C. It enhances the efficiency of infection.
   D. Nucleocapsid of an enveloped virion is incapable of attaching to a susceptible cell without it.

12. What is the basis for grouping viruses into families?
   A. Their genetic material
   B. Their host range and morphology
   C. Their mode of transmission
   D. Their geographic distribution

13. How many different species of viruses are currently known?
   A. More than 3,600
   B. More than 30,000
   C. 164
   D. 71

14. The primary criterion used in the early 1950s to the mid-1960s to compose virus names was--
   A. Geographic location of discovery
   B. Number of symptoms caused
   C. Sigla or abbreviations derived from letters
   D. Mode of transmission.

15. Which of the following is not one of the clinical presentation of Adenoviruses?
   A. Pneumonia
   B. Acute follicular conjunctivitis
   C. Epidemic keratoconjuctivitis
   D. Hepatocellular carcinoma

16. What can stimulate a prophage to undergo induction, leading to specialized transduction?
    A. Bacterial conjugation
    B. Ultraviolet light exposure
    C. Homologous recombination
    D. Viral replication

17. Who identified the first human virus, the yellow fever virus, in 1881?
    A. Martinus Beijerinck
    B. Friedrich Loeffler
    C. Carlos Finlay
    D. Paul Frosch

18. The integrated viral genome in a host cell following reverse transcription is referred to as-----
    A. RNA transcript
    B. ssRNA genome
    C. dsDNA genome
    D. Provirus

19. How does the provirus stage in retroviruses compare to the prophage stage in bacterial infections during the lysogenic cycle?
    A. They are identical stages in different types of infections.
    B. Provirus stage is integrated into host chromosome, while the prophage stage does not.
    C. Prophage stage is integrated into host chromosome, while the provirus stage does not.
    D. Both stages lead to the immediate destruction of the host cell.
20. The following viruses belong to the genus of Orthopox except----------
    A. Pseudo cowpox
    B. Variola virus
    C. Vaccinia virus
    D. Smallpox

**SECTION B: Short Answer Questions (40Marks)**

1. Outline how reoviruses can be diagnosed and treated (8mks)
2. State the prevention and control methods of respiratory viral infections (8mks)
3. Describe the two types of transduction in viruses (8mks)
4. State the common clinical symptoms associated with poxvirus infections? (8mks)
5. Describe the three stages of clinical signs and symptoms of Hepatitis C (8mks)

**SECTION C: Long Answer Questions (60Marks)**

1. Describe the criteria and classification systems used in the taxonomy of viruses, and the significance of taxonomy in understanding viral diversity and controlling viral infections (20mks)
2. Describe the key criteria used by David Baltimore for the classification of viruses? (20mks)
3. Discuss the lysogenic cycle of viruses in Prokaryote Host (20mks)