



W1-2-60-1-6

JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY
UNIVERSITY EXAMINATIONS 2023/2024
EXAMINATION FOR THE DEGREE OF MASTER OF SCIENCE MEDICAL
MICROBIOLOGY

TMM 3100: PATHOGENIC MICROBIOLOGY

DATE: AUGUST, 2024

TIME: 3 HOURS

INSTRUCTIONS: Answer Any FOUR Questions (25 Marks each)

1. The actual inception of microbiology as a distinct science traditionally dates to 1857, identify any 5 key figures and list their contribution in the field of pathogenic microbiology (15 Marks)
 - a. Discuss the classical Koch's Postulates and circumstances during which the postulates may not apply (10 Marks)
2. There is a complex ecosystem comprising approximately 100 trillion microorganisms residing in or on the human body. The body has barriers that provide the crucial first line of defence against these microorganisms. By use of relevant examples, describe what is meant by anatomical barriers to infection (5 Marks).
 - a. List 4 ways in which the body can physically get rid of microorganisms or their products (8 Marks).
 - b. Describe how bacterial antagonism by normal microbiota acts as a non-specific body defence mechanism (8 Marks)
 - c. Briefly describe 2 opportunistic microbes that may cause superinfection upon destruction of the normal microbiota (4 Marks)
3. Discuss the toxic shock syndrome associated with *Staphylococcus aureus* infection (8 Marks)
 - a. List 5 differences between exotoxins and endotoxins (5 Marks)
 - b. Describe two examples where damage caused by a microbes can be used to facilitates its persistence and spread (8 Marks)
 - c. Define the bellow terms (4 Marks)
 - i. Toxoids
 - ii. Neurotoxins
 - iii. Enterotoxins
 - iv. Cytotoxins
4. *Escherichia coli* is a group of facultative anaerobic gram-negative normal flora bacteria. Some strains have been implicated in gastroenteritis. Describe 4 such strains in the bellow subheading: (25 Marks)
 - a. Pathogenesis
 - b. Clinical manifestation
 - c. Laboratory diagnosis
5. Many different morphological features are used in the classification and identification of microorganisms. Describe any five such morphological features (10 Marks)
 - a. Using a flow chart, summarize the classification of *Vibrio cholerae* species into bio types, ribotypes and serotypes (10 Marks)
 - b. State the 5 categories of microbes (5 Marks)

6. Some microbes have the ability to persist or grow in the presence of drugs designed to inhibit or kill them, describe any 5 mechanisms employed by such microbes. **(15 Marks)**
 - a. Antimicrobial resistance is driven by multiple factors, describe any 5 such factors **(10 Marks)**