WI-2-60-1-6

JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY
UNIVERSITY EXAMINATIONS 2025/2026

END OF SEMESTER EXAMINATION FOR THE DEGREE OF MASTERS

TMM 3100: PATHOGENIC MICROBIOLOGY I

DATE: AUGUST 2026 **TIME: 3 HOURS**

INSTRUCTION: Answer Any Four (4) Questions. Each question carries 25 marks

QUESTION ONE

a) Explain Koch's postulates and discuss four limitations of their application in modern microbiology. (10 marks)

b) Describe the role of resident microbiota in protecting the host against infection. (7 marks)

c) Discuss the major host defense mechanisms that prevent microbial invasion and disease. (8 marks)

QUESTION TWO

a) Classify antibiotics according to their mechanism of action and give one example for each class. (10 marks)

b) Discuss five mechanisms by which bacteria develop resistance to antimicrobial agents. (10 marks)

c) Outline five measures that can be used to combat antimicrobial resistance. (5 marks)

QUESTION THREE

a) Compare Staphylococcus aureus and Streptococcus pyogenes under the following headings:
i. Morphology and classification
ii. Virulence factors
iii. Clinical manifestations
iv. Laboratory diagnosis
v. Prevention and control
(15 marks)

b) Discuss the pathogenesis, clinical features and prevention of tetanus. (10 marks)

QUESTION FOUR

a) Discuss the epidemiology, pathogenesis, laboratory diagnosis and prevention of tuberculosis. (15 marks)

b) Describe the clinical manifestations and laboratory diagnosis of diphtheria. (10 marks)

QUESTION FIVE

a) Describe the general characteristics of Enterobacteriaceae. (5 marks)

b) Explain the use of MacConkey agar, Salmonella-Shigella agar and Triple Sugar Iron agar in the identification of Enterobacteriaceae. (10 marks)

c) Compare typhoidal and non-typhoidal Salmonella infections with respect to transmission, pathogenesis and clinical presentation. (10 marks)

QUESTION SIX

a) Discuss the epidemiology, pathogenesis, laboratory diagnosis and prevention of cholera. (15 marks)

b) Write short notes on:
i. Bordetella pertussis
ii. Campylobacter jejuni
iii. Actinomycetes
iv. Spirochetes
(10 marks)