

UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER: MAY 2015

TITLE OF PAPER: MICROBIOLOGY AND IMMUNOLOGY
COURSE CODE: B404
TIME ALLOWED: THREE HOURS

INSTRUCTIONS: 1. ANSWER ANY **FOUR** QUESTIONS
 2. EACH QUESTION CARRIES TWENTY FIVE (25) MARKS
 3. ILLUSTRATE YOUR ANSWERS WITH LARGE AND
 CLEARLY LABELLED DIAGRAMS

SPECIAL REQUIREMENTS: NONE

THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY
THE INVIGILATORS

[PLEASE TURN OVER]

Question 1

- a) How does negative staining differ from other staining procedures? (1 mark)
- b) Distinguish between sterilization and disinfection. (1 mark)
- c) Indicate the Gram's reaction of the following microorganisms: *Mycobacterium*, *Haemophilus*, *Staphylococcus*, *Corynebacterium*, *Klebsiella*, *Neisseria*, *Clostridium*, *Bacillus*, *Escherichia*, *Salmonella*, *Shigella* and *Vibrio* spp. (6 marks)
- d) Name one disease caused by each of the microorganisms listed in (c) above. (6 marks)
- e) If a microbe is subjected to a lethal process, how would you obtain its survivor curve? (1 mark)
- f) Indicate the minimum number of methods that are employed in viral detection within tissues. (2 marks)
- g) Define: D value, LD50 and ID50. (3 marks)
- h) List some methods that are employed in typing bacteria? (2 marks)
- i) Give some examples of penicillins and tetracyclines. (3 marks)

[Total Marks = 25]

Question 2

- a) Write an essay on the determinants of microbial pathogenicity. (12 marks)
- b) Explain the mechanisms of action of antimicrobial drugs. (13 marks)

[Total Marks = 25]

[PLEASE TURN OVER]

Question 3

- a) Write a brief microbiography of any human pathogen of your choice. (12.5 marks)
- b) Write an essay on malignant transformation by tumor inducing viruses. (12.5 marks)

[Total Marks = 25]

Question 4

- a) Explain how specific immunity arises from the cooperation of various cells of the immune system (4 marks)
- b) From an immunological perspective, give a description of the types of antigens we encounter in the environment. (9 marks)
- c) Explain the cellular and physiological mechanisms behind anaphylactic hypersensitivity Type 1. (5 marks)
- d) Explain the concepts behind tissue transplantation immunity. (3 marks)
- e) Explain how cytotoxic and helper T cells react against viruses within host cells. (4 marks)

[Total Marks = 25]

Question 5

- a) Explain the range of virus-cell interactions. (12.5 marks)
- b) Write an essay on viral pathogenesis. (12.5 marks)

[Total Marks = 25]

Question 6

- a) Show a flow chart which demonstrates that cells of the immune system arise from a bone marrow stem cell. (5 marks)
- b) Explain the role of B and T cells in specific host resistance to human pathogens. (15 marks)
- c) Explain the concept of immunologic memory. (5 marks)

[Total Marks = 25]