

**UNIVERSITY OF SWAZILAND**

**FINAL EXAMINATION PAPER: MAY 2018**

**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) Briefly explain how Gram-simple staining differs from the Gram-staining procedure. (1 mark)
- b) Name an infectious unit of a virus. (2 marks)
- c) Distinguish between the roles played by non-specific and specific defence systems in humans. (6 marks)
- d) List five examples of the members of the family Enterobacteriaceae. (5 marks)
- e) Describe how the survival curve of a microbe is determined if it is subjected to a lethal process. (1 mark)
- f) State the minimum number of methods that are employed in viral detection within tissues. (2 marks)
- g) Define the following: D value, LD<sub>50</sub> and ID<sub>50</sub>. (3 marks)
- h) List two methods that are employed in characterising bacteria. (2 marks)
- i) Give three examples of penicillins and tetracyclines. (3 marks)

**[Total Marks = 25]**

**Question 2**

- a) Write an essay on the determinants of microbial pathogenicity. (12.5 marks)
- b) Explain the mechanisms of action of antimicrobial drugs. (12.5 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) Explain the different types of virus-cell interactions. (12.5 marks)

**[Total Marks = 25]**

**Question 4**

- a) Discuss the major phases of an animal's defensive systems based on the self versus non self recognition by the immune system. (4 marks)
- b) Summarize the role of the lymphokines and interferons in non-specific resistance to human infections. (9 marks)
- c) Explain the cellular and physiological mechanisms behind anaphylactic hypersensitivity Type 1. (5 marks)
- d) Provide a flow chart of the T-cell subsets and their functions and then explain how  $T_c$  and  $T_h$  react against viruses within host cells. (7 marks)

**[Total Marks = 25]**

**Question 5**

- a) Discuss malignant transformation by tumor inducing viruses. (12.5 marks)
- b) Discuss viral pathogenesis. (12.5 marks)

**[Total Marks = 25]**

**Question 6**

- a) Show a flow chart which demonstrates that multi potent stem cells in the bone marrow can differentiate into cells of the immune system. (10 marks)
- b) Explain the role of B cells in specific host resistance to human pathogens. (10 marks)
- c) Explain the concept of immunologic memory. (5 marks)

**[Total Marks = 25]**

**[END OF QUESTION PAPER]**