

UNIVERSITY OF ESWATINI
MAIN EXAMINATION PAPER: MAY 2019

TITLE OF PAPER: MICROBIOLOGY AND IMMUNOLOGY

COURSE CODE: B404/BIO432

TIME ALLOWED: THREE HOURS

- INSTRUCTIONS:**
1. ANSWER ANY **FOUR** QUESTIONS
 2. EACH QUESTION COUNTS 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) Indicate the Grams reaction of the following microorganisms: *Mycobacterium*, *Corynebacterium*, *Klebsiella*, *Clostridium*, *Salmonella*, *Shigella* and *Vibrio* spp. (3 marks)
- b) Distinguish between the roles played by non-specific and specific defence systems in humans. (6 marks)
- c) List some examples of the members of the family Enterobacteriaceae. (5 marks)
- d) If a microbe is subjected to a lethal process/adverse conditions, how would you determine its survival curve? (1 mark)
- e) Indicate the minimum number of methods that are employed in viral detection within tissues. (2 marks)
- f) Briefly define: D value, LD50 and ID50. (3 marks)
- g) List some methods that are employed in typing bacteria (2 marks)
- h) Give some examples of penicillins and tetracyclines. (3 marks)

Total Marks = 25]**Question 2**

- a) Discuss the determinants of microbial pathogenicity. (12.5 marks)
- b) Explain the mode of action of antimicrobial drugs. (12.5 marks)

[Total Marks = 25]**[PLEASE TURN OVER]**

Question 3

- a) Make a list of the different groups of the genus *Streptococcus*. (5 marks)
- b) Explain the pathogenicities of:
- i. *Streptococcus pyogenes* (10 marks)
 - ii. *Staphylococcus* species (10 marks)

[Total Marks= 25]

Question 4

- a) Outline the major phases of an animal immune systems based on the self-versus non-self recognition. (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. (5 marks)
- d) Provide a flow chart of the T – cell subsets and their functions and then briefly 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. (12.5marks)
- b) Discuss viral pathogenesis. (12.5marks)

[Total Marks= 25]

Question 6

- a) Provide a flow chart that demonstrates how 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) Relate the concept of vaccines with that of immunologic memory. (5 marks)

[Total Marks= 25]

[END OF QUESTION PAPER]