UNIVERSITY OF ESWATINI

FINAL EXAMINATION PAPER: MAY 2020

TITLE OF PAPER: MICROBIOLOGY AND IMMUNOLOGY

COURSE CODE: B404/BIO432

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) Name the disease caused by each 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 microorganisms that are commonly used in water testing for quality determination. (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) Define: D value, LD50 and ID50. (3 marks)

g) List some methods that are employed in typing bacteria (2 marks)

h) Define an infectious unit of a virus. (3 marks)

Total Marks = 25]

Question 2

a) Explain the determinants of microbial pathogenicity. (12.5 marks)

b) Explain the mechanisms of action of antimicrobial drugs. (12.5 marks)

[Total Marks = 25]

Question 3

a) Name the different groups of the genus *Streptoccoccus.* (5 marks)

b) Either explain the pathogenecities of:
   i. *Streptococcus pyogenes* (10 marks)

   ii. *Staphylococcus* species (10 marks)

OR

Write a brief microbiograph of any human pathogen of your choice. (20 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 Type 1. (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) Write an essay on 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 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]