



UNIVERSITY OF SWAZILAND
Faculty of Health Sciences
DIPLOMA IN ENVIRONMENTAL HEALTH
FINAL EXAM PAPER 2005-6

- TITLE OF PAPER** : INTRODUCTION TO PARASITOLOGY,
MICROBIOLOGY AND IMMUNOLOGY
- COURSE CODE** : HSC 102
- DURATION** : 3 HOURS
- MARKS** : 100
- INSTRUCTIONS** :
- READ THE QUESTIONS & INSTRUCTIONS CAREFULLY**
 - FIVE QUESTIONS AT LEAST TWO QUESTIONS FROM EACH SECTION**
 - EACH QUESTION CARRIES 20 MARKS.**
 - WRITE NEATLY & CLEARLY**
 - NO PAPER SHOULD BE BROUGHT INTO NOR OUT OF THE EXAMINATION ROOM.**
 - BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER.**

DO NOT OPEN THIS QUESTION PAPER UNTIL PERMISSION IS GRANTED BY THE INVIGILATOR.

SECTION A: MICROBIOLOGY & IMMUNOLOGY

QUESTION 1

- (a) Write an essay on the economic importance of fungi. (5 marks)
- (b) What are the toxic effects of aflatoxins? Elaborate. (3 marks)
- (c) Briefly explain the following:
- i) Superficial mycoses (3 marks)
 - ii) Subcutaneous mycoses (2 marks)
 - iii) Systemic mycoses (3 marks)
- (d) What are the factors that influence the incidence of mycoses? (4 marks)

[TOTAL MARKS = 20]

QUESTION 2

- (a) Provide a flow chart to demonstrate that the lymphocytes and other cells of the immune system arise from the bone marrow stem cell. (4 marks)
- (b) Provide a flow chart to demonstrate that specific immunity is the result of the cooperation between macrophages and the lymphocytes. (4 marks)
- (c) Write short notes on the following:
- i) Structure of a monomeric antibody (2 marks)
 - ii) Immunologic memory (2 marks)
 - iii) Characteristics of specific immune response (2 marks)
- (d) Write a short essay on B cells and their functions. (6 marks)

[TOTAL MARKS = 20]

QUESTION 3

- (a) Define the term "antigen". (1 mark)
- (b) Briefly explain the salient features of a:
- i) complete antigen (2 marks)
 - ii) a partial antigen (2 marks)
 - iii) an incomplete antigen (2 marks)
- (c) Explain the events that take place during an anaphylactic type 1 hypersensitive response. (3 marks)
- (d) Write short notes on the following:
- i) Transplantation immunity (5 marks)
 - ii) T cells and their functions (5 marks)

[TOTAL MARKS = 20]

QUESTION 4

- (a) Draw a diagram of a bacterium. (4 marks)
- (b) Why do some species of bacteria produce endospores? Elaborate. (2 marks)
- (c) Classify bacteria in terms of their temperature requirements. (3 marks)
- (d) Draw a growth curve of *E. coli* and explain the events that take place at each phase of growth. (4 marks)
- (e) Explain the pathogenicities of two bacterial pathogens of your choice. (7 marks)

[TOTAL MARKS = 20]

SECTION B PARASITOLOGY

QUESTION ONE

- a. Define a parasite and explain the phenomenon of parasitism and the types of parasites. (2 Marks)
- b. Define a host and then give an account of the effects of parasites on a host. (8 Marks)
- c. Describe the different methods by which protozoa carry out their nutrition and reproduction. (10 Marks)

QUESTION TWO

- a. Give an account of the occurrence or geographical distribution of the following species of protozoa and name the disease (s) each of them causes.
 - i. *Plasmodium falciparum* (5 Marks)
 - ii. *Trypanosoma rhodesiense* (5 Marks)
- b. Describe the transmission and control of the following species of protozoa.
 - i. *Trichomonas vaginalis* (5 Marks)
 - ii. *Entamoeba histolytica* (5 Marks)

QUESTION THREE

- a. Describe the general life cycle and transmission of the trematodes of the subclass Digenea. (15 Marks)
- b. Indicate the special deviations found in each of the following species of trematodes from the general life cycle described in (a) of this question.
 - a. *Schistosoma spp.* (2 Marks)
 - b. *Heterophyes heterophyes* (1.5 Marks)
 - c. *Chlonorchis sinensis* (1.5 Marks)

QUESTION FOUR

Describe the life cycle, public health importance and control of the following cestodes.

- a. *Taenia saginata* (7.0 Marks)
- b. *Taenia solium* (5.0 Marks)
- c. *Echinococcus granulosus* (4.0 Marks)
- d. *Diphylidium caninum* (4.0 Marks)

QUESTION 5

- (a) What is a virus. (4 marks)
- (b) Describe the following:
- (i) Viral replication (4 marks)
 - (ii) Effects of viral infections on cells (3 marks)
 - (iii) Biology of influenza virus (4 marks)
- (c) Name and define the following:
- i) Types of cancer (3 marks)
 - ii) Characteristics of cancer (2 marks)

[TOTAL MARKS = 20]