



UNIVERSITY OF SWAZILAND
Faculty of Health Science

Department of Environmental Health Sciences

Final Examination 2007

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

DO NOT OPEN THE QUESTION PAPER UNTIL PERMISSION HAS BEEN GRANTED
BY THE INVIGILATOR.

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SECTION A

Question 1

- a) Give a concise definition of a virus [4 Marks]
- b) Explain the following:
i. Biology of influenza virus [4 Marks]
ii. Viral multiplication within cells [4 Marks]
- c) Explain how viruses are transmitted and their effects on cells that have been infected by viruses. [8 Marks]

Question 2

- a) Demonstrate the importance of the bone marrow stem cell in generating the cells of the immune system [4 Marks]
- b) Provide a flow chart to demonstrate that specific immune response is the result of the cooperation between various cells of the immune system. [4 Marks]
- c) Explain the following:
i. Structure of a monomeric antibody [2 Marks]
ii. Anamnestic response [2 Marks]
iii. B cells and their functions [8 marks]

Question 3

- a) Give an account on the economic importance of fungi [5 Marks]
- b) Explain the types of mycoses in human being [10 marks]
- c) Name and make a comment on the three major mechanisms of fungal pathogenesis [5 marks]

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Question 4

- a) Define the term 'serology' [1 Mark]
- b) How would you prove that the following antigens induce or do not induce the immune system?
- i. Complete antigen [2 Marks]
 - ii. A partial antigen [2 Marks]
 - iii. An incomplete antigen [2 marks]
- c) Explain an anaphylactic type 1 hypersensitive response in humans [4 marks]
- d) Cite some examples of graft acceptance or rejection during transplantation of human organs [4 marks]
- e) Write a short essay on T cells [5 marks]

Question 5

- a) Draw a generalized diagram of a cell of a bacterium [4 Marks]
- b) What are the shapes of bacteria? Elaborate [2 marks]
- c) Draw and explain the typical growth curve of E. coli. [4 Marks]
- d) How do bacterial reproduce sexually? Elaborate [3 Marks]
- e) Explain the pathogenicities of two bacterial pathogens of your choice. [7 Marks]

SECTION B

Question 1

- a) Describe the general structure of a protozoan parasite [5 marks]
- b) Some protozoan parasites of the genus *Trypanosoma* cause human sleeping sickness
- i. Name the two species involved in causing this disease [2 marks]
 - ii. Give an account of the geographical distribution of each species [3 marks]
 - iii. Name the biological vectors of each species [2 Marks]
 - iv. Give the special name of the human sleeping sickness each of these species causes [3 Marks]
 - v. Outline the measures used to prevent human beings from contracting this disease [5 Marks]

Question 2

- a) Describe how the protozoan parasites *Plasmodium falciparum*, *Plasmodium malariae*, *Plasmodium ovale* and *Plasmodium vivax*, that cause human malaria, are transmitted and give an account of the development of these parasites in man and the vector [10 Marks]
- b) How is the transmission of these *Plasmodium species* prevented or controlled? [10 Marks]

Question 3

- a) Name the two (2) phyla to which the helminthes of importance to humans belong and give a brief description of the general characteristics of the helminthes in each phylum
- b) Indicate the location of the following flukes in the bodies of humans. [5 Marks]
- i. *Fasciola hepatica*
 - ii. *Fasciola gigantica*
 - iii. *Schistosoma haematobium*
 - iv. *Schistosoma mansoni*
 - v. *Schistosoma japonicum*
 - vi. *Fasciolopsis buski*

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- vii. *Heterophyses heretophyses*
- viii. *Clonorchis sinensis*
- ix. *Paragonimus westermanii*

- c) Give an account of the general life cycle of the flukes that infest humans
[10 Marks]

Question 4

- a) Describe the general structure of a typical tape worm infecting humans
[5 Marks]
- b) Name the definite hosts, larval stages and intermediate hosts of the following tape worms.
[5 marks]
- i. *Taenia saginata*
 - ii. *Taenia solium*
 - iii. *Echinococcus granulosus*
- c) Describe how the human infection with the tapeworms named in b) above can be controlled.
[10 Marks]