

# **UNIVERSITY OF SWAZILAND**

## **FACULTY OF HEALTH SCIENCES**

### **SUPPLEMENTARY EXAMINATION PAPER – JULY 2005**

- TITLE OF PAPER : INTRODUCTION TO PARASITOLOGY,  
MICROBIOLOGY AND IMMUNOLOGY
- COURSE CODE : HSC 102
- TIME : 3 HOURS
- MARKS : 100
- INSTRUCTIONS : ANSWER **FIVE** QUESTIONS IN ALL.
- : AT LEAST TWO QUESTIONS MUST BE ANSWERED  
FROM EACH SECTION (I.E. SECTION A OR B)
- : NO FORM OF ANY PAPER SHOULD BE BROUGHT  
INTO NOR OUT OF THE EXAMINATION ROOM
- : BEGIN THE ANSWER TO EACH QUESTION ON A  
SEPARATE SHEET OF PAPER
- : ALL CALCULATIONS/WORKOUT DETAILS SHOULD  
BE SUBMITTED WITH YOUR ANSWER SHEET
- : CALCULATORS MAY BE USED BUT THEY MUST BE  
THE SILENT TYPE

**DO NOT OPEN THIS EXAMINATION PAPER UNTIL PERMISSION IS  
GRANTED BY THE INVIGILATOR**

## SECTION A : INTRODUCTION TO PARASITOLOGY

ANSWER AT LEAST TWO QUESTIONS FROM THIS SECTION

### QUESTION 1

a. MULTIPLE CHOICE : Write the letter corresponding to your chosen answer among those provided for each question.

i. In clinical cases of malaria, the most favourable time to find parasites in the blood is (2)

- A. the period just before a paroxysm
- B. at the beginning of a paroxysm
- C. during late paroxysm stage
- D. just following a paroxysm
- E. None of the above

ii. Fertilized and sometimes decorticated eggs may be found in the stool in infections with (2)

- A. *Taenia saginata*
- B. *Ascaris lumbricoides*
- C. *Necator americanus*
- D. *Trichuris trichiura*
- E. Hookworms

iii. Which of the following is the diagnostic morphologic characteristic for *Balantidium coli* ? (2)

- A. centrally located karyosome
- B. a micro and macronucleus
- C. eccentrically located karyosome
- D. four flagella
- E. large karyosome with faintly visible nuclear membrane

b. Trace a sporozoite of the malaria parasite from the time it is injected through the skin during infection until it is picked up as a gametocyte in the blood of man. (5)

c. Toxoplasmosis is a disease that has gained importance due to its association with HIV infection.

- i. Name the causative agent of toxoplasmosis. (1)
- ii. Name one definitive host of the agent. (1)
- iii. Mention how you may confirm a diagnosis of toxoplasmosis. (1)

- d. Certain processes or practices may result in the transmission of malaria and toxoplasmosis from an infected person to a non-infected person. Mention three such processes and/or practices. (3)
- e. Mention how you may prevent the transmissions mentioned in (d) above from occurring while the processes and/or practices continue. (3)

[20 marks]

## QUESTION 2

- a. For each of the parasites given below, select its most common body location in humans. Choices may be used more than once.

- |                                   |                           |
|-----------------------------------|---------------------------|
| 1. <i>Paragonimus westermani</i>  | i. liver                  |
| 2. <i>Schistosoma haematobium</i> | ii. blood                 |
| 3. <i>Trypanosoma rhodesiense</i> | iii. Intestines           |
| 4. <i>Enterobius vermicularis</i> | iv. Urinary bladder veins |
| 5. <i>Plasmodium malariae</i>     | v. lungs                  |
|                                   | vi. lymph node            |
|                                   | vii. striated muscle      |
|                                   | (5)                       |

- b. *Necator americanus* and *Ancylostoma duodenale* are difficult to differentiate from the egg stage.

- i. Mention two major symptoms that may lead you to suspecting hookworm infection in a patient. (2)
- ii. What method of diagnosis would you use to confirm hookworm infection. (2)
- iii. Explain how you may differentiate between adult *N. americanus* and adult *A. duodenale* (mentioned two methods) (4)

- c. What advice would you give to people in a community to prevent themselves from being infected with hookworm disease ? (2)

- d. Enterobiasis is one of the most common roundworm infection in Swaziland.

- i. Explain how enterobiasis infection may be transmitted from person to person. (2)
- ii. Mention one method you may use to confirm enterobiasis infection in a child. (1)
- iii. Mention two advices you may give to a family to prevent or reduce enterobiasis transmission among children.

[20 marks]

### QUESTION 3

a. **MULTIPLE CHOICE** : Write the letter corresponding to your chosen answer among those provided for each question.

i. Cercaria of this parasite penetrate the skin of humans, thereby causing infection (2)

- A. *Fasciolopsis buski*
- B. *Clonorchis sinensis*
- C. *Schistosoma japonicum*
- D. *Paragonimus westermani*
- E. *Fasciola hepatica*

ii. Eggs appear in sputum in (2)

- A. *Fasciola hepatica*
- B. *Pragonimus westermani*
- C. *Clonorchis sinensis*
- D. *Fasciolopsis buski*
- E. Both *Clonorchis sinensis* and *Paragoimus westermani*

iii. Mark **T** (True) or **F** (False) for each of the statements below :

1. Formed stools need not be refrigerated since protozoa have already formed cysts (1)
2. In general, several sequential faecal specimens (6) should be examined for the presence of any intestinal parasites (1)

b. Mention two differences between helminthes of the class Trematoda and those of the class Cestoda. (2)

c. Name :

- i. one blood fluke that infects humans (1)
- ii. one dioecious fluke (1)
- iii. the ciliated stage of the fluke that hatches from the egg (1)
- iv. one drug used for the treatment of all flukes (1)

d. Swaziland is one country that has heavy infections of biharzia.

- i. Mention FOUR practices in Swaziland that result in people acquiring infection with bilharzias. (4)
- ii. Mention how these transmission methods may be encountered in a community to result in reduced transmission rates. (4)

[20 marks]

#### QUESTION 4

- a. MULTIPLE CHOICE : Write the letter corresponding to your chosen answer among those provided for each question.

As a rule, only ring forms and crescent-shaped gametocytes are observed in peripheral blood with infections of

(2)

- A. *Plasmodium vivax*
- B. *Plasmodium malariae*
- C. *Plasmodium vivax*
- D. *Plasmodium ovale*
- E. All of the above

- b. Match the following with the appropriate statements (just write the corresponding roman numeral next to the number, not the whole statement e.g. 6 . f

- 1. *Giardia lamblia*
- 2. *Trichomonas vaginalis*
- 3. *Entamoeba histolytica*
- 4. *Pneumocystis carinii*

- i. parasite has up to four nuclei in a round cyst
- ii. has a thick walled cyst which may contain up to eight sporozoites
- iii. parasite has four anterior flagella
- iv. cyst passed in soft or fluid faeces and ingested by man to result in acute diarrhoea

(4)

- c. *Pneumocystis carinii* pneumonia (PCP) is fast causing death in an increasingly large number of people the world over.

- i. Explain why PCP is now causing death in a large number of people. (2)
- ii. Write down briefly the symptoms that would make you suspect an infection with PCP in a patient. (4)
- iii. Name the drug(s) you may recommend for the treatment of PCP (2)  
What other additional measures are necessary when treating PCP ? (2)
- iv. How do you think people acquire infection with PCP ? Give reasons for your answer. (4)

[20 marks]

**SECTION B : MICROBIOLOGY**

**ANSWER AT LEAST TWO QUESTIONS FROM THIS SECTION**

**QUESTION 5      20 MARKS**

A. Distinguish PROKARYOTES from EUKARYOTES by mentioning **any four** cell structures that are unique to prokaryotes and **any four** cell structures that are unique to eukaryotes..

(8,8)

B. Mention **two** cell components or structures that are common to both the Eukaryotic cells as well as the Prokaryotic cells

(2,2)

**QUESTION 6      20 MARKS**

Discuss the distinguishing characteristics of each of the 5 types of antibody classes that are part of our immune system.

**QUESTION 7      20 MARKS**

What are the common conditions or diseases that the following organisms are responsible for:

- (i) *Candida albicans*
- (ii) *Mycobacterium tuberculosis*
- (iii) *Giardia intestinalis*
- (iv) *Chlamydia trachomatis*
- (v) *Streptococcus pneumoniae* (10)

Different toxins have different effects on the body. Mention the toxin that causes the effects described next:

- (i) flaccid paralysis
- (ii) alteration of intestinal permeability
- (iii) inhibition of protein synthesis
- (iv) spastic paralysis
- (v) scarlet fever rash (10)

**QUESTION 8      20 MARKS**

- A. What are the different types of *Microbiocidal cells (T-Lymphocytes)* (4)
- B. What causes the immune system to start attacking self antigens? (5)
- C. What type of immunity is Vaccination? (6)
- D. Categorise white blood cells. (5)