

UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

SUPPLEMENTARY EXAMINATION PAPER – JULY, 2015

TITLE OF PAPER : INTRODUCTION TO PARASITOLOGY

COURSE CODE : HSC 104

TIME : 2 HOURS

MARKS : 100

INSTRUCTIONS : ANSWER QUESTION 1 AND ANY THREE QUESTIONS

: EACH QUESTION CARRIES 25 MARKS

**: NO FORM OF PAPER SHOULD BE BROUGHT INTO
NOR TAKEN OUT OF THE EXAMINATION ROOM**

**: BEGIN THE ANSWER TO EACH QUESTION ON A
SEPARATE SHEET OF PAPER**

**: CALCULATORS MAY BE USED BUT THEY MUST BE
THE SILENT TYPE**

**: ALL CALCULATIONS/WORK-OUT DETAILS SHOULD BE
SUBMITTED WITH YOUR ANSWER SH**

This question paper consists of 7 printed pages including this one

QUESTION 1**a. MULTIPLE CHOICE**

Indicate your response to items in this question by writing down the letter corresponding to your chosen answer among the possible options provided.

- i. Which one of the statements below about *Trichomonas vaginalis* is NOT true?
 - A. Most infected individuals do not show symptoms
 - B. All symptomatic cases develop complications if untreated
 - C. The incidence of the disease is higher in females than in males
 - D. *Trichomonas vaginalis* is the only trichomonad of medical importance
 - E. *Trichomonas vaginalis* is commonly transmitted in humans during unprotected sexual intercourse with an infected partner

- ii. Some protozoa consist of a unique feature in their structure , a kinetoplast, which is a DNA containing structure in the mitochondrion. Which one of the following protozoan parasites has a kinetoplast?
 - A. *Isospora belli*
 - B. *Plasmodium falciparum*
 - C. *Trypanosoma rhodesiense*
 - D. *Giardia lamblia*
 - E. *Balantidium coli*

- iii. Human infections with some helminthes occur through skin penetration by larval stages. In which of the helminthes below do human infections commonly occur through skin penetration by larvae?
 - A. *Enterobius vermicularis*
 - B. *Taenia solium*
 - C. *Fasciola hepatica*
 - D. *Strongyloides stercoralis*
 - E. *Ascaris lumbricoides*

- iv. Which one of the parasites below has the ability to destroy liver tissue of infected human hosts through physical or mechanical damage due to the size of the parasite?
 - A. *Fasciolopsis buski*
 - B. *Ascaris lumbricoides*
 - C. *Plasmodium falciparum*
 - D. *Fasciola hepatica*
 - E. *Entamoeba histolytica*

- v. A parasite is recovered from the bloodstream of an infected child from Zimbabwe. Its life cycle in the human host is studied and it is found to reproduce by both sexual and asexual methods. The parasite is likely to be:
- A. *Entamoeba histolytica*
 - B. *Cryptosporidium parvum*
 - C. *Toxoplasma gondii*
 - D. *Plasmodium vivax*
 - E. *Trypanosoma gondii*
- vi. Which of the parasites below commonly causes "travelers diarrhoea"?
- A. *Trichomonas vaginalis*
 - B. *Entamoeba histolytica*
 - C. *Balantidium coli*
 - D. *Cryptosporidium parvum*
 - E. *Giardia lamblia*
- vii. Infection with giardiasis may cause acute watery diarrhoea that leads to dehydration. Therefore, during assessment of a patient it is important to assess for dehydration. Which one of the following is NOT a sign of dehydration?
- A. sunken eyes
 - B. pale skin
 - C. weight loss
 - D. reduced urine output
 - E. loss of skin turgor
- viii. Infection with hookworm causes disease in humans through:
- A. physical/mechanical damage
 - B. toxic metabolic wastes
 - C. allergic reactions
 - D. formation of lesions that may be infected with bacteria
 - E. All of the above
- ix. Antibody (serologic) tests are usually unreliable in confirming parasite infections because:
- A. They may not differentiate previous from current infections
 - B. They have a low sensitivity (too many infected persons are missed)
 - C. They have a low specificity (too many uninfected persons test positive)
 - D. They cannot be used on a large scale such as in the field
 - E. They utilize complex techniques that require highly skilled operators
- x. The infective stage of *Wuchereria bancrofti* is:
- A. the egg
 - B. a cercaria
 - C. a metacercaria

- D. *Cysticercus cellulosae*
- E. a microfilaria

- b. Write **T** (for true) or **F** (for false) for each of the statements below: (5)
- i. During a commensal relationship between a host and a parasite, both the parasite and the host benefit.
 - ii. Intestinal parasites may have life-cycle stages in the heart, circulation or lungs
 - iii. Chloroquine is the drug of choice currently used for treating uncomplicated malaria in Swaziland
 - iv. *Taenia saginata* infections may cause severe disease due to *Cysticercus bovis* in man.
 - v. *Enterobius vermicularis* infection in man may occur through inhalation of airborne eggs to establish lung disease.

[25 marks]

QUESTION 2

- a. Coccidian parasites have now become major public health problems in Sub-Saharan Africa than anywhere in the world.
- i. List THREE features that characterize members of the Coccidia Subclass. (3)
 - ii. Explain why Coccidian parasites cause major problems in Sub-Saharan Africa than anywhere in the world. (2)
 - iii. Discuss major points of a control programme that you can initiate among Sub-saharan countries to reduce incidence of Coccidian parasite infections. (6)
- b. African trypanosomiasis cause problems mainly in two areas of Africa.
- i. Describe the two areas in Africa where African trypanosomiasis is endemic. (2)
 - ii. Name the two species of African trypanosomes indicating the part where each species is endemic. (4)
 - iii. Explain why the two species of African trypanosomes prevail in different areas of Africa. (4)
 - iv. List TWO strategies you may initiate at these African trypanosomiasis endemic areas to reduce incidence of the disease. (4)

[25 marks]

QUESTION 3

- a. High malaria incidence has major economic implications at family, national and corporate levels. Discuss briefly how malaria is an economic burden at each of these levels:
- i. family (3)
 - ii. national (3)
 - iii. industry (3)

- b. Even though malaria incidence has decreased significantly in Swaziland, cases continue to be diagnosed at some foci.
- Name the species of malaria parasite predominantly identified among cases in Swaziland. (1)
 - Give the common name and the technical name of the vector responsible for malaria transmission in Swaziland. (2)
 - Describe the habitat for the breeding of the malaria vector mentioned in (ii) above. (3)
- c. Infection with malaria parasites often leads to malarial attacks and to complications such as anaemia and cerebral involvement if not promptly treated. Discuss briefly the events that lead to these symptoms:
- malarial attack (3)
 - anaemia (2)
 - cerebral malaria (3)
- d. The World Health Organization (WHO) recommends use of artemisinin combination therapies (ACTs) for the treatment of all uncomplicated malaria. Explain the advantage of using ACTs over non-combined (monotherapies) in reduction of malaria incidence among endemic countries. (2)

[25 marks]

QUESTION 4

- a. Some helminthes are hermaphroditic while others have dioecious life cycles. Explain the difference between hermaphroditic and dioecious life cycles. (2)
- b. Examine each of the helminth parasites listed below and state which one are hermaphroditic and which one are dioecious. (5)
- Schistosoma mansoni*
 - Necator americanus*
 - Fasciola hepatica*
 - Taenia saginata*
 - Enterobius vermicularis*
- c. Digenean trematodes have life cycles that involve two intermediate hosts.
- Describe briefly the general life cycle of Digeneans other than Schistosomes. (3)
 - Name two intermediate hosts in which Digenean life cycles occur. (2)
 - Discuss TWO major differences between the life cycles of other Digeneans and the Schistosomes. (4)
 - Name one drug commonly used to treat all infections with Digenean parasites. (1)
- d. Control of Digenean parasites may be partly achieved by instituting measures with long term positive results. Discuss community measures you may include in your strategy to reduce incidence of Digenean parasite infections with long term results. (8)

[25 marks]

QUESTION 5

- a. *Giardia lamblia* infections occur in tropical and temperate areas of the world while infections with *Ascaris lumbricoides* occur predominantly in tropical climates.
- Explain why there is a difference in the global distribution of *G. lamblia* and *A. lumbricoides* infections. (2)
 - Describe a laboratory procedure you may recommend to confirm *G. lamblia* infection in a patient. (3)
 - Describe a laboratory procedure you may use to confirm *A. lumbricoides* infection. (3)
- b. *G. lamblia* and *A. lumbricoides* have different methods of pathogenesis. Describe the pathogenesis that results in the symptoms typical of infections with each of the parasites, *G. lamblia* and *A. lumbricoides*. (5)
- c. Light infections with *G. lamblia* are treated while light infections with *A. lumbricoides* may not be treated.
- Name one drug used for successful treatment of infections with *G. lamblia*. (1)
 - Besides administration of the drug mentioned in (i) above, describe other precautions the healthcare worker has to undertake to successfully cure infection with *G. lamblia*. (4)
 - Name one drug you may use to successfully treat infection with *A. lumbricoides*. (1)
- d. Describe community initiatives you may recommend to reduce infections with both *G. lamblia* and *A. lumbricoides*. Explain how each of the initiatives is likely to deliver the desired positive impact. (6)

[25 marks]**QUESTION 6**

- a. Hookworm and *Strongyloides stercoralis* produce similar symptoms among infected patients. Describe the symptoms elicited by the parasite at the following body parts of the host:
- Cutaneous (3)
 - Pulmonary (3)
 - Intestinal tract (3)
- b. Explain how you may differentiate the cutaneous symptoms resulting from hookworm infections from those resulting from infection with *Strongyloides stercoralis*. (4)
- c. *Strongyloides stercoralis* infections may result in 'hyperinfection syndrome', which results from autoinfection with the parasite. Describe how autoinfection occurs during *Strongyloides stercoralis* infection, including factors associated with autoinfection. (4)
- d. Identification of infecting hookworm species is limited by the similarities of egg stages (the diagnostic stage) of the infecting species. Describe a method you may suggest to identify the species during diagnosis of hookworm infection. (4)
- e. Discuss TWO community strategies you may initiate to reduce incidence of both hookworm and *Strongyloides stercoralis* infections. (4)

[25 marks]