

UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

SUPPLEMENTARY EXAMINATION PAPER – JULY, 2011

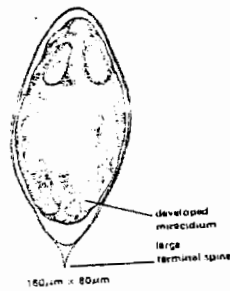
TITLE OF PAPER : INTRODUCTION TO PARASITOLOGY
COURSE CODE : HSC 104
TIME : 2 HOURS
MARKS : 100

INSTRUCTIONS : ANSWER QUESTION 1 AND FOUR OTHERS
: QUESTION 1 IS COMPULSORY
: EACH QUESTION IS 20 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
: ALL CALCULATIONS/WORK OUT DETAILS
SHOULD BE SUBMITTED WITH YOUR
ANSWER SHEET

ANSWER QUESTION 1 AND ANY FOUR QUESTIONS FROM THIS SECTION.

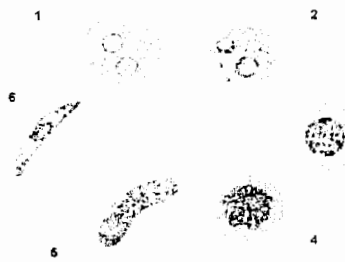
QUESTION 1 (COMPULSORY)

- i. Which one of the following parasites is a commensal in the intestines of man?
- A. *Endolimax nana*
 - B. *Trichomonas hominis*
 - C. *Entamoeba dispar*
 - D. *Iodamoeba bütschlii*
 - E. All of the above
- ii. Which one of the following diseases is NOT associated with HIV infection?
- A. amoebiasis
 - B. isosporiasis
 - C. cryptosporidiosis
 - D. toxoplasmosis
 - E. None of the above
- iii. Identify the species of the egg shown below:



- A. *Paragonimus westermani*
- B. *Schistosoma haematobium*
- C. *Schistosoma mansoni*
- D. *Fasciola hepatica*
- E. *Schistosoma japonicum*

iv. The diagram shown below are

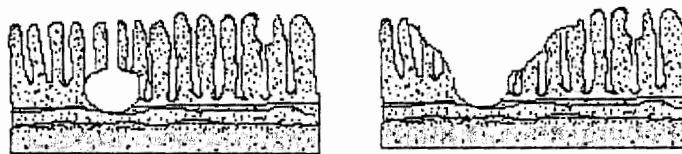


- A. a gametocyte, ring and schizont stages of *Plasmodium falciparum*
- B. a gametocyte, schizont and a ring stages of *Plasmodium vivax*
- C. a sporozoites and a trophozoite stage of *Plasmodium falciparum*
- D. a sporozoites and a schizont stages of *Plasmodium vivax*
- E. a gametocyte, ring stages and a schizont of *Plasmodium ovale*

v. Which one of the following protozoa is a flagellate parasite of the gastrointestinal tract?

- A. *Leishmania donovani*
- B. *Trichomonas vaginalis*
- C. *Trypanosoma rhodesiense*
- D. *Balantidium coli*
- E. *Giardia lamblia*

vi. The ulcers shown below are respectively due to infection with



(1)

(2)

- A. *Balantidium coli* and *Entamoeba histolytica*
- B. *Entamoeba histolytica* and *Balantidium coli*
- C. Both *Balantidium coli*
- D. Both by *Entamoeba histolytica*
- E. Neither *Balantidium coli* nor *Entamoeba histolytica*

vii. The main vector of east and southeast African trypanosomiasis is

- A. *Glossina palpalis*
- B. *Glossina fuscipes*
- C. *Glossina morsitans*
- D. *Glossina tachinoides*
- E. Both A and C

- viii. The drug currently use to treat uncomplicated malaria in Swaziland is
- artemether-lumefantrine
 - chloroquine
 - artesunate - amodiaquine
 - artesunate - sulphadoxine/pyrimethamine.
 - sulphadoxine-pyrimethamine
- ix. *Toxoplasma gondii*, *Isospora belli* and *Cryptosporidium parvum* are all coccidia because they leave the body of their hosts as thick walled cysts in faeces. What makes *Toxoplasma gondii* differ from the other two?
- Both *Isospora belli* and *Cryptosporidium parvum* involve multiple hosts
 - Both *Isospora belli* and *Cryptosporidium parvum* involve tissue cysts
 - Toxoplasma gondii* carry out their entire life cycle within the intestinal epithelial cells of the host
 - Toxoplasma gondii* involves tissue cysts
 - Toxoplasma gondii* symptoms are accompanied by abdominal discomfort and diarrhoea
- x. Fever, headache, anorexia, nausea, vomiting and right upper quadrant and epigastric pain, and liver enlargement are common symptoms associated with:
- Paragonimus westermani*
 - Clonorchis sinensis*
 - Fasciola hepatica*
 - Schistosoma mansoni*
 - Fasciolopsis buski*

[20 marks]

QUESTION 2

- Name two parasites associated with:
 - malaria relapses (2)
 - malaria recrudescence (2)
- Explain the processes that lead to the development of a:
 - relapse (3)
 - recrudescence (3)
- Write brief notes on the following:
 - Blackwater fever due to malaria (3)
 - Malaria in children (4)
 - Malaria in pregnancy (4)
 - Name the drug currently used for malaria prophylaxis among travellers in Swaziland. (1)

[20 marks]

QUESTION 3

Entamoeba histolytica and *Balantidium coli* both cause fulminating dysentery in humans.

- a. Which of the two, amoebiasis or balantidiasis is a zoonotic infection? (1)
- b. Explain how you can differentiate between the symptoms of a patient suffering from one of the two infections. (3)
- c. Mention two reasons why the trophozoites of *B. coli* usually are not found in extra-intestinal tissues compared to those of *E. histolytica* which may be found in the liver, lungs, heart, etc. (4)
- d. Name the drug of choice for treating:
 - i. invasive amoebiasis (1)
 - ii. luminal (non-invasive amoebiasis) (1)
 - iii. balantidiasis (1)
- e. Is there an association between HIV infection and amoebiasis infection? If yes, state the relationship. (3)
- f. Discuss three control strategies that may be useful against both *B. coli* and *E. histolytica* in a community that has high incidence of the two diseases, also explaining how each strategy would have an impact. (6)

[20 marks]

QUESTION 4

- a. *Toxocara canis* has been implicated in visceral larva migrans in humans particularly involving the CNS and eye. Embryonated eggs of *Toxocara canis* remain infective for months to years.
 - i. What conditions kill the eggs or shorten the length of time the eggs remain infective in the soil? (3)
 - ii. Mention one method by which toxocariasis is confirmed in the laboratory. (2)
 - iii. Name one drug you may recommend for successful treatment of toxocariasis. (1)
 - iv. Toxocariasis is generally a zoonotic infection. Name two domestic animals that are responsible for perpetuating *Toxocara* infections in humans. (2)
 - v. Discuss two methods you may use to reduce transmission of toxocariasis from the animals mentioned in (iv) above to humans. (4)
- b. *Toxoplasma gondii* is another parasitic infection whose life cycle is perpetuated by a domestic animal.
 - i. Name the reservoirs host of *T. gondii*. (1)
 - ii. List 4 methods by which humans may acquire infection with *T. gondii*. (4)
 - iii. List 3 methods by which infections of humans with *T. gondii* can be prevented. (3)

[20 marks]

QUESTION 5

- a. Schistosomiasis is a common infection in the Lowveld of Swaziland.
- i. Explain the predisposing factors that make this disease highly prevalent in the Lowveld of Swaziland. (3)
 - ii. Discuss briefly, the symptoms involved in chronic intestinal schistosomiasis. (3)
 - iii. Serology is often used to determine infection with *S. haematobium* in Swaziland. Explain why serologic methods are not suitable to confirm the presence schistosomiasis in humans. (2)
 - iv. List 5 methods that could be recommended to achieve individual protection against schistosomiasis infections in humans. (5)
- b. Another common fluke infection in Swaziland is fasciolopsiasis.
- i. Explain how humans acquire fasciolopsiasis infection. (2)
 - ii. Explain briefly how fasciolopsiasis may be confirmed in the laboratory. (2)
 - iii. Name one drug commonly used to successfully treat human infections with *Fasciolopsis buski*. (1)
 - iv. Name two methods you may use to prevent infection with *Fasciolopsis buski*. (2)

[20 marks]

QUESTION 6

- a. Soil-transmitted nematodes cause more than 2 billion infections among the impoverished annually.
- i. Name the four species of helminths involved in soil-transmitted helminthiasis. (4)
 - ii. Explain why soil-transmitted helminths are more common among poor communities and families. (4)
 - iii. Name one drug that may be used to treat effectively all 4 species of helminths involved in soil-transmitted helminthiasis. (1)
 - iv. Discuss 3 methods that could be used in a community or by individual families to reduce infections with the soil-transmitted nematodes. (6)
- b. Complete the passage below about *Diphyllobothrium latum* life cycle.

Eggs and mature proglottids are continuously excreted into cool, freshwater from faeces of infected hosts. A ciliated(i)..... escapes through the operculum. It is eaten by an appropriate species of(ii)..... within 12 hours. It burrows into the hoemocele and transforms into a(iii).....,larva. The copepod is eaten by a(iv)..... where it transforms into a(v)..... larva in flesh or connective tissue. (5)

[20 marks]

QUESTION 7

a. Write T (true) or F (false) for each of the following statements: (5)

- i. Cryptosporidiosis has an extra-intestinal course in AIDS patients.
- ii. Thick-blood smears are good for detecting presence of malaria infection because they concentrate red blood cells by a factor of about 40 times.
- iii. Individuals who lack glucose-6-phosphate dehydrogenase (G6PD) enzyme enjoy some degree of protection from *Plasmodium vivax* infection
- iv. People who have mental problems are at a higher risk of acquiring toxoplasmosis than normal people.
- v. The tiger is also a definitive host of *Toxoplasma gondii*.

b. The symptoms of cryptosporidiosis include diarrhoea, anorexia, weight loss, nausea and vomiting.

- i. Explain the pathogenesis that causes diarrhoea during cryptosporidiosis infection in patients. (3)
- ii. How does the diarrhoea differ in patients with a low CD4 cell count as a result of HIV infection compared to immunocompetent patients of cryptosporidiosis? (2)
- iii. How can cryptosporidiosis be confirmed in the laboratory? (2)
- iv. Name one drug that may be used to treat a patient confirmed with cryptosporidiosis. (1)
- v. Also, mention one drug that may be used to treat a similar disease, isosporiasis. (1)
- vi. Mention **two** ways humans may acquire infection with cryptosporidiosis (2)
- vii. Describe **two** methods that may be useful in preventing infection with both isosporiasis and cryptosporidiosis. (4)

[20 marks]