UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

SUPPLEMENTARY EXAMINATION PAPER – JULY, 2013

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

INSTRUCTIONS	:	ANSWER **QUESTION 1** AND **ANY FOUR** QUESTIONS
	:	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
	:	CALCULATORS MAY BE USED BUT THEY MUST BE THE SILENT TYPE
	:	ALL CALCULATIONS/WORK-OUT DETAILS SHOULD BE SUBMITTED WITH YOUR ANSWER SHEET

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QUESTION 1: COMPULSORY **[All students <u>MUST</u> answer this question]**

Indicate your response to this question by writing the letter corresponding to your chosen answer among those provided for each sub-question.

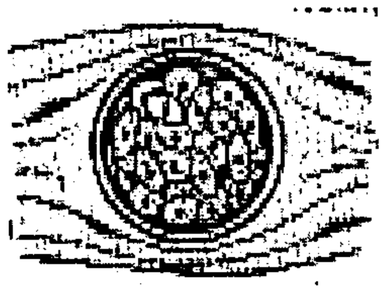
i. A protozoan parasite is recovered from a patient. Its life cycle is studied and it is found that it reproduces asexually and not by sexual methods. Which one of the protozoan parasites below is the parasite likely to be?
   A. *Plasmodium falciparum*
   B. *Entamoeba histolytica*
   C. *Isospora belli*
   D. *Toxoplasma gondii*
   E. *Cryptosporidium parvum*

ii. In a mutualistic relationship between a parasite and a host,
   A. the two associates cannot exist without each other
   B. the parasite benefits and the host does not benefit
   C. the parasite only is physiologically or metabolically dependent upon its host and not the host
   D. there is an asymptomatic relationship between the parasite and the host
   E. both the parasite and the host benefit but the host may be harmed

iii. The presence of a parasite in the human body that raise an instant and sufficiently high immune response is called a(n)
   A. lytic reaction
   B. toxic reaction
   C. mechanical damage
   D. allergic reaction
   E. enzymatic reaction

iv. Hookworms such as Necator americanus or Ancylostoma duodenale reproduce
   A. asexually
   B. sexually
   C. by binary fission
   D. by conjugation
   E. both sexually and asexually

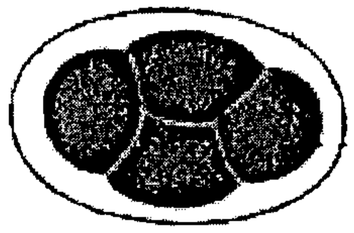
v. The diagram below is recovered from the cross-sectional tissue of an infected patient. The parasite is likely to:



   A. belong to the subphylum Mastigophora
   B. belong to the subphylum Sarcodina

C. be transmitted through ingestion
D. be transmitted through the bite of an arthropod vector
E. to belong to Subclass Haemosporina that have no apparatus of movement

vi. A child reports with a 'ground itch' and upon examination is found to have iron deficiency anaemia. The doctor orders a stool examination and recovers the following egg.



The child is like to be infected with:
A. *Necator americanus*
B. *Ancylostoma duodenale*
C. *Trichuris trichiura*
D. *Enterobius vermicularis*
E. Either A or B

vii. The infective stage that results in *Taenia solium* adult worm infection in humans is
A. the egg
B. the adult worms
C. *Cysticercus cellulosae*
D. *Cysticercus bovis*
E. *Echinococcus granulossus*

viii. During the life cycle of *Diphylobothrium latum*, the coracidium enters the body of a crustacean and turns into a ..... larva.
A. procercoid
B. plerocercoid
C. rhabditiform
D. filariform
E. metacercarial

ix. A young man from South-east Asia is reports the following symptoms: ***Fever, headache, anorexia, nausea, vomiting and right upper quadrant and epigastric pain***.
The young man is likely to be suffering from:
A. fasciolopsiasis
B. paragonimiasis
C. clonorchiasis
D. fascioliasis
E. schistosomiasis mansoni

x. The following parasite stages are identified from the blood of an infected man. The parasite shown below is likely to be

A. *Plasmodium malariae*
B. *Plasmodium vivax*
C. *Plasmodium ovale*
D. *Plasmodium knowlesi*
E. *Plasmodium falciparum*

[20 marks]

QUESTION 2

a. Carefully examine the statements below about parasites and write **T** (true) or **F** (for false) (5)

i. Parasites with a direct life cycle might be easier to control than parasites with intermediate hosts

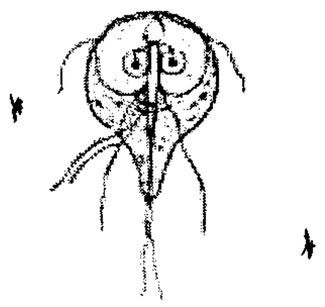
ii. Parasites with a direct life cycle usually have a capacity to multiply outside the definitive host

iii. Miracidia of *Schistosoma mansoni* are never attracted other invertebrates (planaria, leeches) as well as other host snails.

iv. A majority of protozoans produce a non-parasitic infection in the human host.

v. Plasmodium falciparum species have no apparatus of locomotion.

b. A young child suffers from profuse diarrhoea. The doctor orders a stool examination and the parasite below is recovered.



i. Name the parasite shown above. (1)

ii. What is the common name of the parasite? Give reasons for such a common name. (3)

iii. How do you think the child acquired the infection. (3)

iv. Explain how the parasite causes diarrhoea. (3)

v. What drug would you recommend to successfully treat the child? (1)

vi. Besides administration of the antimalarial drug, what treatment precautions would you take on the child to prevent death or complications. Explain the reasons for the treatment precautions you would suggest. (4)

[20 marks]

QUESTION 3

A couple from Swaziland visits Bilene, a malaria endemic area north of Mozambique. On return, the man suffers from what the doctors claims is a "malarial attack" and uses a rapid diagnostic test to confirm his suspicion.

a. Explain what a "malarial attack" is. (3)
b. Explain two problems associated with making a clinical diagnosis as a basis for prescribing antimalarial treatment without a rapid diagnostic test. (4)
c. Upon confirmation of the infection, the doctor prescribes antimalarials for the man.
   i. What antimalarial is the doctor likely to prescribe? (1)
   ii. Why is it important to adhere to the treatment dosage prescribed by the doctor? (2)
   iii. What species of malaria is likely to be confirmed by microscopy in the man? Give reasons. (2)
d. Upon further investigation, the man claims to have made an attempt to prevent mosquito bites while in Bilene by sleeping under an insecticide treated bednet.
   i. Describe three ways an insecticide treated net may prevent mosquito bites.(6)
   ii. If the man claims he slept under an insecticide treated net but still acquired the infection, how do you think he may have been infected? (2)

[20 marks]

QUESTION 4

a. Balantidiasis is said to be a zoonotic commensal of the human digestive tract.
   i. Explain why balantidiasis is said to be a zoonotic infection. (2)
   ii. Why is the disease said to be a commensal? (2)
   iii. During clinical diagnosis how would you use symptoms to differentiate between balantidiasis and amoebiasis. (4)
   iv. How can you differentiate balantidiasis symptoms from those resulting during giardiasis infection. (2)
   v. During laboratory diagnosis, what features would you use to differentiate Balantidium coli from Giardia lamblia? (4)

b.
   i. What is the infective stage of African trypanosomiasis? (1)
   ii. Name the two parasites responsible for African trypanosomiasis. (2)
   iii. Name the genus of the vector responsible for transmission of African trypanosomiasis in man. (1)
   iv. Besides vector transmission, how can African trypanosomiasis be transmitted from an infected person to another. Mention two ways. (2)

[20 marks]

QUESTION 5

a. A two-year old child is brought to a paediatric clinic with a prolapsed rectum following chronic diarrhoea and dysentery accompanied by abdominal cramps and tenesmus. Upon further examination, the child is found to have clubbed fingers, petechial and sub-epithelial haemorrhages and lesions.
   i. What helminthic disease do you think the child could be infected with? (1)
   ii. What is the cause of the mucosal lesions? (2)
   iii. What other disease do the mucosal lesions predispose the child to? (1)
   iv. What does the clubbing of the fingers in the child suggest? (2)
   v. The child is also found to have iron deficiency anaemia. What is the cause for the iron deficiency anaemia? (2)
   vi. Explain what method may be used to confirm the infecting parasite species. (3)
b. A second child of about the same age reports to the same paediatric clinic with a wheezing chest and rales, overt kwashiorkor and

[20 marks]

QUESTION 6

a. Taeniasis solium is a common infection in tropical areas with poor sanitary practices.
   i. What poor sanitary practices lead to taeniasis solium infections in humans? (2)
   ii. Describe briefly the symptoms associated with *Taenia solium* infection. (2)
   iii. Discuss **FOUR** methods/actions that contribute to reduction of adult taeniasis infections in humans. (8)
   iv. Explain one laboratory method by which infection with taeniasis solium may be confirmed. (3)
b. Complete the table on flukes shown below by writing the roman numeral and the appropriate response. (5)

Fluke	Infective stage	Intermediate host
Paragonimus westermani	(i)	(ii)
Fasciola hepatica	(iii)	(iv)
Schistosoma haematobium	(v)	

[20 marks]

QUESTION 7

a. Name the sites in the body of man where adults of the following worm infections are likely to reside. (5)
   i. *Schistosoma mansoni*
   ii. *Trichuris trichiura*
   iii. *Enterobius vermicularis*
   iv. *Ascaris lumbricoides*
   v. *Necator americanus*

b. Untreated infection with *Trichuris trichiura* results to iron deficiency anaemia and rectal prolapse and appendicitis.
   i. What causes iron deficiency anaemia in *T. trichiura* infection. (2)
   ii. Explain the cause of rectal prolapse. (2)
   iii. What is the cause of appendicitis? (2)

c. Children infected with Enterobius vermicularis results in perianal pruritus and eczematous skin lesions.
   i. What causes perianal pruritus? (2)
   ii. What causes eczematous skin lesions? (2)
   iii. List two ways a child may acquire infection with enterobiasis. (2)
   iv. Describe the method employed in the laboratory to confirm infection with *Enterobius vermicularis*. (3)

[20 marks]