UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

MAIN EXAMINATION PAPER – MAY, 2014

TITLE OF PAPER	:	INTRODUCTION TO PARASITOLOGY
COURSE CODE	:	HSC 104
TIME	:	2 HOURS
MARKS	:	80

INSTRUCTIONS	:	ANSWER **QUESTION 1** AND **ANY THREE** OTHER QUESTIONS
	:	EACH QUESTION CARRIES 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

This question paper consists of 6 printed pages including this one

QUESTION 1 MULTIPLE CHOICE **[All Students must answer this question]**

Indicate your responses to these questions by writing the letter corresponding to your chosen answer.

i. *Entamoeba histolytica* is an anaerobic protozoan parasite. Which of the statements about *Entamoeba histolytica* is **NOT** true?
   A. The parasite is unicellular.
   B. The parasite does not exist where there is oxygen
   C. The parasite can exist where there is no oxygen
   D. Cysts of the parasites are readily killed by heat and by freezing temperatures.
   E. Symptoms of infection include fulminating dysentery and bloody diarrhoea.

ii. Which one of the following parasites is commonly a commensal of the human gut?
   A. *Trichuris trichiura*
   B. *Toxoplasma gondii*
   C. *Balantidium coli*
   D. *Taenia solium*
   E. *Schistosoma mansoni*

iii. One of the parasites below produces opportunistic disease in man. Which one is it?
   A. *Cryptosporidium parvum*
   B. *Entamoeba histolytica*
   C. *Enterobius vermicularis*
   D. *Plasmodium vivax*
   E. *Trichomonas vaginalis*

iv. A laboratory technologist identifies the parasite shown below from some diagnostic medium in the laboratory.

From what medium is the parasite likely to have been identified?
   A. faeces
   B. urine
   C. urethral discharge
   D. lymph node fluid
   E. lung aspirate

v. A 9-year old boy that normally resides in Mbabane, Swaziland visits Northern Mozambique with his family. After 12 days, the boy shows with headache and chills. He is taken to the hospital and upon examination it is revealed that his body temperature is 41°C. The following parasites are identified from his blood.

Which one of the parasites below do you think is likely to be infecting the boy?

A. *Plasmodium vivax*
B. *Plasmodium falciparum*
C. *Toxoplasma gondii*
D. *Plasmodium malariae*
E. *Isospora belli*

vi. The following stage of parasite is identified from the faeces of an infected child.

To what Subclass is the parasite likely to belong?

A. Mastigophora
B. Sarcodina
C. Coccidia
D. Haemosporina
E. Rhizopodia

vii. A parasite is recovered from the faeces of an infected child and found to have the following characteristics:

> *Has a dorso-ventrally flattened and segmented body that is also bilaterally symmetrical, lacks a body cavity and has a rostellum.*

What parasite is the child likely to be infected with?

A. *Paragonimus westermani*
B. *Taenia solium*
C. *Taenia saginata*
D. *Fasciola hepatica*
E. *Ascaris lumbricoides*

viii. Which method among those listed below is likely to prevent human infection with *Fasciola hepatica* parasites?

A. Excluding watercress from diet
B. Washing hands after visiting the toilet and before handling food
C. Thoroughly cooking fish
D. Thoroughly cooking crabs and crayfish
E. Thoroughly cooking liver of cattle

ix. The drug recommended by the World Health Organization for successful treatment of *Ancylostoma duodenale* infections is:
   A. Praziquantel
   B. Metronidazole
   C. Mebendazole
   D. Chloroquine
   E. Paromomycin

x. Which one of the vectors below is commonly involved in the transmission of *Wuchereria banchrofti* to man?
   A. tsetsefly
   B. blackfly
   C. housefly
   D. triatomine bud
   E. *Anopheles* mosquito

QUESTION 2

a. A laboratory technologist looks at a stool sample and identifies the parasites shown below:

   i. What parasite is shown above? (1)
   ii. How do infections with this parasite in man occur? (2)
   iii. Describe briefly the symptoms commonly associated with infections with this parasite in man? (3)
   iv. Discuss THREE methods incidence of this parasite may be reduced in communities. (6)

b. Give FOUR structural differences between *Trichomonas vaginalis* and *Balantidium coli*. (4)

c. A laboratory technologist identifies *Entamoeba dispar* from the stool sample of a patient.
   i. What does the appearance of *Entamoeba dispar* signify about the patient? (1)
   ii. What advice would you give to the patient and why? (3)

[20 marks]

QUESTION 3

a. Swaziland, South Africa, Botswana and Namibia have achieved control of malaria such that the countries have embarked on pre-elimination, a step towards eradication of the disease.
   i. What is the difference between elimination and eradication of malaria? (2)
   ii. If a country achieves elimination, what strategy (ies) is the local malaria control programme of the country likely to emphasize to maintain a disease-free status? (4)

b. Write down the species of malaria described in each of the statements below:
   i. Comprises 90% of Global malaria (1)
   ii. Was formerly known to be a monkey species and not humans (1)
   iii. Forms crescent shaped gametocytes (1)
   iv. Forms a band across the infected red blood cell (1)

c. During malaria diagnosis by microscopy, slide smears for both thin and thick smears are prepared.
   i. What is the advantage of preparing thin smears? (2)
   ii. What is the advantage of preparing a thick smear? (2)

d. The World Health Organisation recommends artemisinin combination therapies for successful treatment of uncomplicated malaria.
   i. Name one drug recommended by the World Health Organisation for the successful treatment of uncomplicated malaria. (1)
   ii. List TWO advantages of artemisinin combination therapies over the traditional monotherapies? (2)

e. Students from the Environmental Health Department of the Faculty of Health Sciences of UNISWA visit Sithobela, a malaria endemic area of the Lowveld for a week. List three methods the students are likely to use to prevent mosquito bites while at Sithobela. (3)

[20 marks]

QUESTION 4

A 10-year old boy reports to the Bilharzia and Worm Control Unit in Manzini with complaints of blood in urine and frequent urination. The attending healthcare worker requests the boy to submit a urine sample in a container she provided. She then placed a strip of paper into the urine which showed with a colour change. She then suggests that the boy might be infected.

i. What species of parasite might be infecting the boy? (1)
ii. What other diagnostic measures is the healthcare worker likely to undertake to confirm the infection? (3)
iii. Why is the urine test described above where a strip of paper was used not used as a final confirmation of the infection? (2)
iv. Explain how the boy might have acquired this infection. (3)
v. What is the cause of the blood in the urine of the boy? (3)
vi. What is the cause of the frequent urination? (3)
vii. Name one drug the healthcare worker is likely to prescribe for the boy to be successfully treated. (1)

viii. Discuss TWO community initiatives you would suggest to be put in place for the community of this boy to prevent future infections with this parasite. (4)

[20 MARKS]

QUESTION 5

a. *Isospora belli* and *Cryptosporidium parvum* belong to the Subclass Coccidia. List three similarities between the two parasites that mandate their classification under the same Subclass. (3)
b. What similarities are there between *Toxoplasma gondii* and the Coccidia? (2)
c. Why is *Toxoplasma gondii* commonly NOT classified in the Coccidia Subclass? (2)
d. Toxoplasma gondii exists in two different stages in immunocompromised and immunocompetent people.
   i. What is the stage of *Toxoplasma gondii* in immunocompromised people? (1)
   ii. Name the stage of *Toxoplasma gondii* prevalent in immunocompetent people. (1)
   iii. Explain why *Toxoplasma gondii* infections are commonly acquired in the early ages of life of humans. (4)
   iv. List three different methods by which humans acquire infections with *Toxoplasma gondii.* (3)
   v. Discuss TWO ways infections with *Toxoplasma gondii* may be prevented. (4)

[20 marks]

QUESTION 6

a. Consider the helminths given below and use the list to answer the questions that follow:

   Taenia solium, *Fasciola hepatica*, *Trichuris trichiura*, *Ascaris lumbricoides*

   i. Name two helminths that are dioecious. (2)
   iii. Name two helminths that are hermaphroditic. (2)
   iv. Name one helminth that has a segmented body. (1)
   v. Name two helminth that are NOT acquired through ingestion of eggs. (2)
b. *Trichuris trichiura* is sometimes referred to as a "threadworm". Explain why the parasites is sometimes called a threadworm. (2)
c. Eggs of *Fasciola hepatica* are recovered from the stool of a young man.
   i. Could this the presence of eggs confirm that the young man is infected with Fasciola hepatica adult worms? Explain our answer. (3)
   ii. How can infection with *Fasciola hepatica* prevented in the community. (4)
d. Discuss TWO community strategies you may recommend to reduce incidence of *Trichuris trichiura* and *Ascaris lumbricoides.* (4)

[20 marks]