

UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

SUPPLEMENTARY EXAMINATION PAPER – JULY, 2012

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

INSTRUCTIONS : ANSWER **QUESTION 1** AND **ANY FOUR** OTHER
QUESTIONS

: 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

QUESTION 1: COMPULSORY – [All students must answer this question]

Indicate your responses to this question by writing the letter corresponding to your chosen answer among those given for each sub-question:

- i. Confirmatory laboratory tests often depend on identification of the parasite in the patient. Why can't diagnosis be confirmed using serologic tests?
 - A. Serologic tests take too long to complete
 - B. Serologic tests often require expensive kits to perform
 - C. Serologic tests require experts or experienced personnel to perform
 - D. Serologic test may give false result if the patient has had a previous infection
 - E. Serologic tests have a lower sensitivity than microscopy

- ii. Parasites are grouped into Subphyla based on
 - A. their method of motility
 - B. the site/organ they parasitize in the host's body
 - C. the method of transmission e.g. arthropod borne or faeco-oral parasites
 - D. specific morphologic features
 - E. types of hosts parasitized

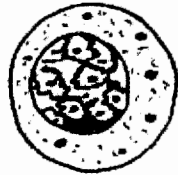
- iii. Which one of the following is the mechanism by which *Ascaris lumbricoides* cause damage to their host?
 - A. Causing intestinal lesions which are exacerbated by secondary bacterial infection
 - B. Toxic effects of metabolic by-products from the host
 - C. Causation of malnutrition through consumption of nutrients and leaving adequate amounts for the host
 - D. Secretion of enzymes that digest host tissue causing abscesses
 - E. Raise an allergic immune reaction in the host's body that results to tissue damage

- iv. The diagram below shows the head and mouthparts of a roundworm. The roundworm shown is
 - A. *Trichuris trichiura*
 - B. *Ancylostoma duodenale*
 - C. *Necator americanus*
 - D. *Strongyloides stercoralis*
 - E. *Ascaris lumbricoides*

- v. The majority of cases of malaria in Swaziland are due to:
 - A. *Plasmodium malariae*
 - B. *Plasmodium vivax*
 - C. *Plasmodium falciparum*
 - D. *Plasmodium ovale*
 - E. *Plasmodium knowlesi*

- vi. Which of the following malaria parasites has been considered an animal species until recently?
- A. *Plasmodium malariae*
 - B. *Plasmodium vivax*
 - C. *Plasmodium falciparum*
 - D. *Plasmodium ovale*
 - E. *Plasmodium knowlesi*

- vii. The diagram below is



- A. a merozoite stage of *Plasmodium falciparum*
 - B. a sporozoite stage of *Plasmodium falciparum*
 - C. a gametocyte of *Plasmodium falciparum*
 - D. a gametocyte stage of *Plasmodium vivax*
 - E. a merozoite stage of *Plasmodium vivax*
- viii. A worm is recovered from the bowels of a young child and is found to be unsegmented, has an alimentary canal and a body cavity. The worm is likely to be:
- A. a cestode
 - B. a trematode
 - C. a nematode
 - D. either a cestode and a nematode
 - E. either a cestode or trematode
- ix. Which of the following parasitic infections is/are endemic in Swaziland?
- A. *Schistosoma matthei*
 - B. *Schistosoma mansoni*
 - C. *Schistosoma haematobium*
 - D. *Fasciola hepatica*
 - E. All of the above
- x. The egg shown below is



- A. an unfertilised egg of *Ascaris lumbricoides*
- B. an unembryonated egg of *Ascaris lumbricoides*
- C. a fertilised egg of *Ascaris lumbricoides*
- D. an embryonated egg of *Ascaris lumbricoides*
- E. an embryonated egg of *Ancylostoma duodenale*

QUESTION 2

- a. Write **T** (for true) or **F** (for false) in each of the following statements: (5)
- Cysts require concentration methods during diagnosis and trophozoites do not require such methods T
 - Infection with Coccidian parasites is often accompanied by diarrhoea and abdominal discomfort. T
 - The incubation period of *Plasmodium falciparum* is 28 days.
 - The infective stage of *Toxoplasma gondii* is a tachzoite.
 - Trichomonas vaginalis* is an aerotolerant anaerobic protozoa.
- b. Trichomonas infections occur worldwide in tropical and temperate climates.
- Why are *Trichomonas vaginalis* infections more common among women than men? (3)
 - List three ways you may prevent infection with *Trichomonas vaginalis*. (3)
- c. Toxoplasmosis in pregnancy can lead to serious medical problems, particularly to the baby.
- Mention FOUR likely effects of late infection (third trimester) of a pregnant woman with *Toxoplasma gondii* infection. (4)
 - Why is infection of a woman in the third trimester more dangerous than pre-pregnancy infection? (3)
 - List two precautions a pregnant woman has to take to prevent the foetus acquiring toxoplasmosis. (2)

[20 marks]

QUESTION 3

- a. What is the common name for trypanosomiasis
- in animals? (1)
 - in humans? (1)
- b. Trypanosomiasis is an arthropod-borne disease.
- What is the common name for the arthropod responsible for transmission of trypanosomiasis? (1)
 - What is the technical name for the arthropod? (1)
 - Other than through arthropod transmission, mention two other methods by which humans may acquire trypanosomiasis infection. (2)
- c. What is the recommended drug for successful treatment of:
- trypanosomiasis rhodesiense (1)
 - trypanosomiasis gambiense (1)
 - patients with abnormal cerebrospinal fluid (1)
- d. What method of diagnosis would you use to confirm a patient who is suspected to be infected with trypanosomiasis? (2)
- e. Discuss three methods by which an individual may protect himself or herself from bites of the vector for trypanosomiasis. (6)
- f. Another blood and tissue protozoa cause serious disease and morbidity in Sub-Saharan Africa.
- Name one blood and tissue protozoa that cause disease in man. (1)

- ii. What is the common name of the arthropod responsible for transmission of this protozoa to man? (1)
- iii. Name the species of the arthropod mainly responsible for the current transmission of the disease in Swaziland. (1)

[20 marks]

QUESTION 4

- a. For each of the following parasitic infections write down the best drug you would recommend for successful treatment. (5)
 - i. giardiasis
 - ii. malaria
 - iii. bilharzia
 - iv. ascariasis
 - v. toxoplasmosis
- b. Isosporiasis and cryptosporidiosis are two protozoan infections that have recently shown increased morbidity and mortality.
 - i. Why has morbidity and mortality due to isosporiasis and cryptosporidiosis only increased recently? (2)
 - ii. Describe the pathogenesis that results to diarrhoea in humans infected with *Isospora belli*. (3)
 - iii. In what part of the human body do the adult worms of *Isospora belli* and *Cryptosporidium parvum* reside? (2)
 - iv. Discuss two methods by which individuals may prevent infection with either isosporiasis or cryptosporidiosis. (4)
- c. *Isospora belli* and *Toxoplasma gondii* are often both classified as Coccidian parasites. Why do some scientists classify the two parasites differently. (4)

[20 marks]

QUESTION 5

- a. What are the larval stages of the following helminths called?
 - i. *Taenia solium* (1)
 - ii. *Taenia saginata* (1)
- b. Explain how infection of *Taenia solium* occurs in humans (2)
- c. Describe an effective method of diagnosis for *Taenia solium* and *Taenia saginata*. (3)
- d. Explain how, during the diagnosis, you can differentiate between *Taenia solium* and *Taenia saginata*. (4)
- e. Discuss three (3) methods you may recommend for control of *Taenia solium* infections in a community. (6)
- f. A third tapeworm, *Diphyllobothrium latum*, causes numerous human infections in South-East Asia.
 - i. What is the infective stage of *D. latum*? (1)
 - ii. Write down two methods for prevention of diphyllobothriasis infection. (2)

[20 marks]

QUESTION 6

- a. Write down the infective stages of the following parasites: (7)
- Fasciola hepatica*
 - Ascaris lumbricoides*
 - Fasciolopsis buski*
 - Trichomonas vaginalis*
 - Schistosoma haematobium*
 - Plasmodium falciparum*
 - Giardia lamblia*
- b. The egg of *Trichuris trichiura* is not immediately infective after leaving the human body but that of *Enterobius vermicularis* is. Explain the difference in infectivity between the two eggs. (2)
- c. Describe briefly the symptoms you would associate with *Enterobius vermicularis* infection. (3)
- d. A house-holder complains of *Enterobius vermicularis* infection among all the six children in the family.
- How do you think the infection was brought to the homestead? (2)
 - How did the other children acquire the infection from the one who brought it to the homestead? (3)
 - What advice would you give the householder to prevent future infections with *Enterobius vermicularis*? (3)

[20 marks]

QUESTION 7

- a. Copy the table below and fill in the portal of entry and the portal of exit of the following parasites from the human body. (5)

Parasite	Portal of Entry	Portal of Exit
<i>Entamoeba histolytica</i>		
<i>Trichomonas vaginalis</i>		
<i>Ancylostoma duodenale</i>		
<i>Toxoplasma gondii</i>		
<i>Schistosoma haematobium</i>		

- b. Explain how *Entamoeba histolytica* causes an ulcer on the microvilli of the intestines. (3)
- c. Explain why *Entamoeba histolytica* is involved in extra-intestinal infection while *Balantidium coli* is not despite that it also causes intestinal ulcers. (4)
- d. During formation of communicating channels of ulcers during *Entamoeba histolytica* infection, what complications occur on the tissue above the channels? (2)
- e. During diagnosis of *Entamoeba histolytica* infection, how can you differentiate between a mature 4-nucleated *Entamoeba histolytica* trophozoite identified in faeces and an immature 4-nucleated *Entamoeba coli*. (4)
- f. List two community interventions you would recommend to reduce incidence of *Entamoeba histolytica* infection. (2)

[20 marks]