Name _____

Medical Parasitology (EEB 3895)
Lecture Exam #2

November 2017

Read through the exam once before you begin. Read the questions CAREFULLY; be certain to provide all of the information requested. In instances in which you are asked to answer only a SUBSET of the questions, if you answer more questions than indicated, your answers will be graded in order, and only the number of questions you are required to answer will be graded. Note: for HOST species, the common name is sufficient; for parasite taxa the correct full scientific name is required unless otherwise indicated. Do not use abbreviations for scientific names.

1. Select FIVE (5) of the relevant images (labeled A through R) in the color plate on the second last page of the exam that could represent circumstances involving a zoonotic parasite species, and for each identify a potential reservoir host that is *shown in the image* (common name is fine) AND the parasite species for which that host could serve as a reservoir host. You may NOT use the same image or parasite species more than once. (15 points)

a. (i) Letter of image _____

(ii) Potential reservoir host shown in image _____

(iii) Parasite species _____

b. (i) Letter of image _____

(ii) Potential reservoir host shown in image _____

(iii) Parasite species _____

c. (i) Letter of image _____

(ii) Potential reservoir host shown in image _____

(iii) Parasite species _____

d. (i) Letter of image _____

(ii) Potential reservoir host shown in image _____

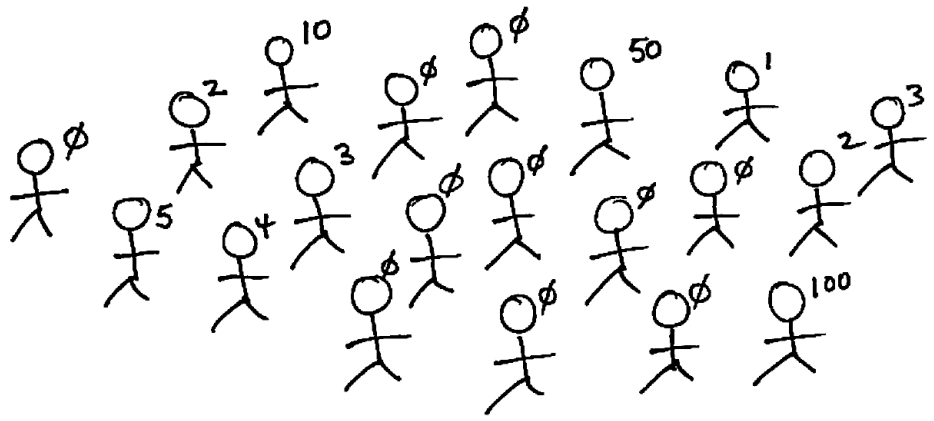
(iii) Parasite species _____

e. (i) Letter of image _____

(ii) Potential reservoir host shown in image _____

(iii) Parasite species _____

2. Use the number of specimens of *Fasciolopsis buski* in the population of 20 individuals illustrated below to answer the following questions. Note that in each case the number of *F. buski* specimens is indicated to the right of the head of the individual. (Show your calculations) (6 points)



(i) What is the average intensity of infection of *F. buski* in this population?

(ii) What is the prevalence of infection of *F. buski* in this population?

3. You have been engaged to write the script for a new parasitic platyhelminth "horror" film—all the rage just now in Alaska and northern Canada! Your charge is to frighten your audience from the north with a story line involving a parasite that they could actually acquire, while also educating them about how they might go about avoiding the infection. Describe the story line you might develop that would fulfill these criteria. Be sure to identify the species of parasite on which your film would focus. (5 points)

4. From the list of parasite species provided below identify a taxon that fulfills all of the criteria listed fro SIX (6) of the following 9 questions. You may NOT use a species more than once. (12 points)

Fasciolopsis buski	*Echinococcus multilocularis*
Cyclospora cayatanensis	*Taenia solium*
Fasciola hepatica	*Toxoplasma gondii*
Diphyllobothrium latum	*Schistosoma haematobium*
Taenia saginata	*Cryptosporidium parvum*
Schistosoma mansoni	*Paragonimus westermani*

a. Protist that is facultatively heteroxenous.

b. Exhibits sequential polyembryony but has only two hosts in its life-cycle.

c. Has a hexacanth embryo and a two-host life-cycle.

d. Mates in blood and its eggs escape with host urine.

e. Has juveniles that often get lost on their way to their preferred site in the definitive host.

f. Infection can be avoided by resisting the temptation to eat trendy raw (spiced) fish while vacationing in Europe.

g. non-zoonotic apicomplexan.

h. Uses humans as both intermediate and definitive hosts.

i. Zoonotic protist that causes diarrhea in vertebrate hosts.

5. Select a disease caused by a parasitic platyhelminth and provide the following information (8 points):

(i) Name of disease.

(ii) Etiological agent of the disease.

(iii) Describe how a person would acquire an infection of the parasite responsible for the disease.

(iv) Describe how you would go about *definitively* diagnosing infection with the parasite.

(v) Describe the pathogenicity associated with infection of the parasite in the human host.

6. Answer each of the following questions regarding polyembryony (7 points)

(i) What role does polyembryony serve in the life-cycle of parasitic platyhelminths?

(ii) Identify a genus that exhibits sequential polyembryony AND identify one of its life-cycle stages that undergoes polyembryony.

(iii) Identify a genus that exhibits simultaneous polyembryony AND identify one of its life-cycle stages that undergoes polyembryony.

7. Anoletta has developed the unusual hobby of collecting parasite specimens. To date, her collection includes specimens of a species each of each of the following genera: *Fasciola*, *Schistosoma*, *Cryptosporidium*, *Taenia*, *Clonorchis*, *Hymenolepis*, *Toxoplasma*, and *Echinococcus*. Answer FOUR (4) of the following 7 questions based on her collection. You may NOT use any of her specimens more than once. (8 points)

a. Does her collection include a platyhelminth? YES/NO (circle one)
If so, list a genus:

b. Does her collection include a eucestode? YES/NO (circle one)
If so, list a genus:

c. Does her collection include a species that is heteroxenous? YES/NO (circle one)
If so, list a genus:

d. Does her collection include a species that is dioeceous? YES/NO (circle one)
If so, list a genus:

e. Does her collection include a neodermatan? YES/NO (circle one)
If so, list a genus:

f. Does her collection include a member of the Class Aconoidasida? YES/NO (circle one)
If so, list a genus:

g. Does her collection include a species that lives in the liver of its definitive host? YES/NO (circle one)
If so, list a genus:

8. Describe the mechanism by which eggs of schistosomes are able to escape their site in the vasculature of their definitive host to be released to the outside environment. (3 points)

9. For THREE (3) of the following 5 cases explain why the circumstances described would NOT result in the production of eggs or oocysts (as appropriate) by the parasite indicated in the human host involved. (9 points)

a. A small child accidentally ingests a gravid proglottid of *Taenia saginata*.

b. A boy fishing in bare feet off a beach in New England wanders into waters infected with numerous cercariae of *Austrobilharzia variglandis*.

c. A woman cleaning a kitty litter box accidentally ingests sporulated oocysts of *Toxoplasma gondii*.

d. A man intentionally, although unwisely, ingests raw snails infected with redia of *Paragonimus westermani*.

e. A girl enters water infected with cercariae of *Schistosoma mansoni* but exits after only one cercaria is able to penetrate her skin.

10. Identify an epidemiological situation (from the photos labeled A through R) in the colour plate on the second last page of the exam that explains an element of the life-cycle of THREE (3) of the following 6 parasite scenarios. (9 points)

a. *Diphyllobothrium latum* natural cycle
(i) letter of photo:

(ii) explanation for choice:

b. *Echinococcus granulosus* urban cycle
(i) letter of photo:

(ii) explanation for choice:

c. *Clonorchis sinensis* natural cycle
(i) letter of photo:

(ii) explanation for choice:

d. *Echinococcus granulosus* sylvatic cycle
(i) letter of photo:

(ii) explanation for choice:

e. *Schistosoma mansoni* natural cycle
(i) letter of photo:

(ii) explanation for choice:

f. *Toxoplasma gondii*
(i) letter of photo:

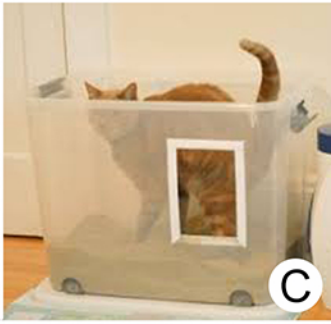
(ii) explanation for choice:

11. Complete 18 of the 24 blank cells in the following table. You may NOT use the same parasite species more than once. (18 points)

Parasite species	First intermediate host; common name is fine (write N/A if not applicable)	Life-cycle stage released from human host (be specific); (write N/A if not applicable)	ALL life-cycle stages infective to human host
Paragonimus westermani			
Clonorchis sinensis			
	copepod		
	N/A	unsporulated oocyst	
			cercaria
	not required		sporulated oocyst, bradyzoites in zoitocyst (tachyzoites)
		eggs	
Echinococcus granulosus		N/A	
Taenia solium			


A


B

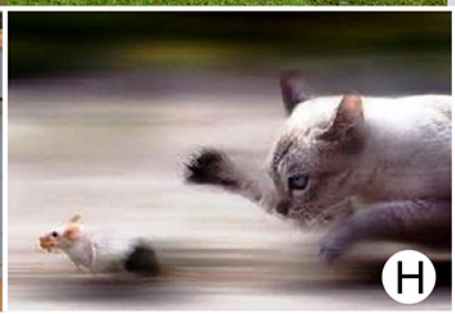

C


D


E


F


G


H


I


J


K


L


M


N


O


P


Q


R