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University Examinations 2023/2024

SECOND YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF
BACHELOR OF SCIENCE IN MEDICAL LABORATORY

HML 3228: MEDICAL HELMINTHOLOGY

DATE: APRIL 2024

TIME: 3 HOURS

INSTRUCTIONS:

- (i) The paper consists of **Three** Sections
- (ii) Section A: Multiple Choice Questions (Answer all questions)
- (iii) Section B: Short Answer Questions (Answer all questions)
- (iv) Section C: Long Answer Questions (Choose any Two questions)

SECTION A: MULTIPLE CHOICE QUESTIONS (20 MARKS)

1. Which of the following parasites exhibits a unique ability to autoinfect its host, allowing for perpetuation of the infection without external exposure?
 - a) *Strongyloides stercoralis*
 - b) *Ancylostoma duodenale*
 - c) *Trichuris trichiura*
 - d) *Enterobius vermicularis*
2. What is the definitive host for *Dracunculus medinensis*?
 - a) Humans
 - b) Dogs
 - c) Cattle
 - d) Fish

3. Which of the following statements about the life cycle of *Fasciola hepatica*, is correct?
 - a) Humans become infected by ingesting eggs shed in the feces of definitive hosts.
 - b) Metacercariae penetrate the skin of humans to establish infection.
 - c) Miracidia are released from eggs in water and penetrate snails to undergo further development.
 - d) Adults reside in the small intestine of humans, where they produce eggs that are shed in feces.
4. Which of the following parasites is known to cause the condition known as trichinosis, characterized by muscle pain, fever, and periorbital edema?
 - a) *Trichuris trichiura*
 - b) *Trichinella spiralis*
 - c) *Toxocara canis*
 - d) *Trichobilharzia spp.*
5. What is the primary mode of transmission for *Paragonimus westermani* to humans?
 - a) Consumption of raw or undercooked freshwater fish
 - b) Inhalation of airborne cysts
 - c) Skin penetration by cercariae
 - d) Ingestion of eggs in contaminated water
6. Which of the following nematodes is associated with the highest prevalence of infection worldwide?
 - a) *Ancylostoma duodenale*
 - b) *Ascaris lumbricoides*
 - c) *Trichuris trichiura*
 - d) *Enterobius vermicularis*
7. In which part of the body do adult female *Enterobius vermicularis* deposit their eggs?
 - a) Colon
 - b) Small intestine
 - c) Appendix
 - d) Perianal region

8. What is the primary diagnostic method for detecting *Strongyloides stercoralis* larvae in human stool samples?
- Fecal flotation
 - Fecal smear examination
 - Fecal antigen detection
 - Fecal PCR
9. Which of the following nematodes is responsible for causing the disease known as river blindness?
- Onchocerca volvulus*
 - Dracunculus medinensis*
 - Wuchereria bancrofti*
 - Loa loa*
10. In which part of the human body do adult *Schistosoma mansoni* worms typically reside?
- Liver
 - Lungs
 - Intestines
 - Blood vessels
11. Which of the following nematodes is known to have a direct life cycle, meaning it does not require an intermediate host for transmission?
- Enterobius vermicularis*
 - Ascaris lumbricoides*
 - Ancylostoma duodenale*
 - Necator americanus*
12. Which of the following parasites is known to cause elephantiasis, characterized by severe swelling of the limbs and genitals?
- Onchocerca volvulus*
 - Wuchereria bancrofti*
 - Loa loa*
 - Dracunculus medinensis*

13. What is the primary diagnostic method for identifying microfilariae of *Onchocerca volvulus* in skin snips?
- Microscopic examination
 - PCR analysis
 - Serological testing
 - Ultrasonography
14. Which of the following parasites is known to cause the condition known as hydatid disease, characterized by the formation of cysts in various organs?
- Echinococcus granulosus
 - Hymenolepis nana
 - Dipylidium caninum
 - Taenia solium
15. Which parasite is known for its characteristic whip-like appearance and is commonly referred to as the whipworm?
- Taenia saginata
 - Taenia solium
 - Hymenolepis nana
 - Trichuris trichiura
16. What is the primary route of infection for humans with *Taenia saginata*?
- Ingestion of contaminated water
 - Inhalation of airborne eggs
 - Consumption of undercooked beef
 - Direct contact with infected individuals
17. Which of the following tapeworms is associated with causing cysticercosis in humans
- Taenia saginata*
 - Taenia solium*
 - Hymenolepis nana*
 - Echinococcus granulosus*
18. What is the intermediate host for *Echinococcus granulosus*, the dog tapeworm?
- Sheep
 - Cattle

- c) Pigs
- d) Human

19. Which of the following parasites is known to cause gastrointestinal symptoms and vitamin B12 deficiency?

- a) *Hymenolepis nana*
- b) *Echinococcus granulosus*
- c) *Diphyllobothrium latum*
- d) *Fasciolopsis buski*

20. What is the primary mode of transmission for humans with *Fasciolopsis buski*?

- a) Consumption of raw or undercooked fish
- b) Ingestion of contaminated water plants
- c) Penetration of skin by cercariae
- d) Ingestion of eggs in contaminated water

SECTION B: SHORT ANSWER QUESTIONS (40 MARKS)

1. Describe the life cycle of *Taenia saginata* (5 marks)
2. Describe the life cycle of *Hymenolepis nana* (5 marks)
3. Highlight the pathogenesis and clinical features of *Echinococcus granulosus* (5 marks)
4. Describe the life cycle of *Fasciolopsis buski* (5 marks)
5. Write short notes on pathogenicity of *Trichuris trichiura* (5 marks)
6. Briefly discuss clinical manifestations of *Wuchereria bancrofti* (5 marks)
7. Outline the general characteristics of Nematodes (5 marks)
8. Outline the general characteristics of Cestodes (5 marks)

SECTION C: LONG ANSWER QUESTIONS. Attempt any 2 questions (20 Marks each)

1. A mother visits a gastroenterologist and mentions that both her 6-year-old son and 8-year-old daughter have been frequently scratching their anal regions, especially at night, and she's noticed them being irritable and having trouble sleeping. She expresses concern about the possibility of an infection or parasite infestation, as she recalls her children playing outdoors frequently. Upon examination, the doctor observes redness and mild inflammation around the perianal area of both children.

- a) Outline the likely parasite causing the infection (1 mark)
 - b) In detail, describe the life cycle of the parasite (11 marks)
 - c) Describe the pathogenicity of the parasite (4 marks)
 - d) Outline the laboratory diagnostic approaches (4 marks)
2. Mr. Kikunzu, a 45-year-old man, presents at KNI-I with complaints of abdominal pain, nausea, and unintentional weight loss over the past few months. He mentions that he has been experiencing intermittent episodes of diarrhea and has noticed small, rice-like segments in his stool. He additionally reports occasional headaches and dizziness. Upon further questioning, he reveals that he frequently consumes pork, often in the form of traditional dishes, and occasionally eats undercooked pork.
- a) Outline the likely parasite causing the infection (1 mark)
 - b) List the general characteristics of the parasite (6 marks)
 - c) Describe its lifecycle (7 marks)
 - d) Outline its different laboratory diagnostic procedures (6 marks)
3. A 32-year-old child visited the Coast County Referral Hospital with diarrhea and abdominal pain. Clinical history indicated she regularly feed on aquatic vegetation including water chestnut and water cress. A stool sample was requested which demonstrated helminthic eggs.
- a) Outline the likely parasite (1 mark)
 - b) Discuss the life cycle and pathogenesis of the parasite (13 marks)
 - c) Outline the treatment, prevention and control measures (6 marks)