

Name: _____

VMP 930 -- Final Exam
(100 questions @ 2 points each = 200 points total)

Protozoa (60 points)
Arthropods (30 points)

Nematodes (80 points)
Platyhelminthes (30 points)

Protozoa (60 points)

Multiple Choice (There is one best answer for each question.)

1. A 5-year-old gelding presents with ataxia and incoordination in all four limbs. A CSF tap reveals antibodies to *Sarcocystis neurona*. How did the horse most likely acquire this infection?
A. ingestion of sarcocysts in the muscle tissue of an infected opossum
B. accidental ingestion of caddisflies from the pasture creek
C. transmission of sporozoites via the bite of a tabanid fly
D. ingestion of sporocysts from opossum feces in contaminated feed or water
E. direct contact or interaction with an infected horse
2. A woman owns 3 cats and has just found out she is pregnant. Her doctor advises her to consult her veterinarian to determine her risk of parasite-associated complications. What should you do?
A. Request a stool sample from both the cats and the woman. And do a fecal exam to try to find *Toxoplasma gondii* oocysts.
B. Recommend serological testing for only the cats for *Toxoplasma gondii*.
C. Recommend serological testing against *Toxoplasma gondii* for the cats for and recommend she ask her doctor that she also be serologically tested for *Toxoplasma gondii*.
3. Which feline protozoan causes a disease that is seasonal (spring & summer), with clinical signs of febrile disease, dyspnea, jaundice, and lab diagnostics showing pancytopenia, hyperbilirubinemia and schizont-laden macrophages on blood smear?
A. *Toxoplasma gondii* **B. *Cytauxzoon felis*** C. *Babesia gibsoni*
D. *Cystoisospora rivolta* E. *Tritrichomonas foetus feline*
4. *Toxoplasma gondii* is a serious zoonotic disease for pregnant women, with the potential for causing fetal defects. Which of the following has the most potential for transmitting *T. gondii* ?
A. A young indoor/outdoor cat B. An old feral dog C. An old indoor cat
5. There are many species of protozoa that cause diarrhea in cattle. Which of the following protozoa causes watery diarrhea (calf scours) in 7 to 14 day old calves?
A. *Eimeria leuckarti* B. *Eimeria tenella* C. *Eimeria bovis*
D. *Cystoisospora rivolta* **E. *Cryptosporidium parvum***
6. *Toxoplasma gondii* is a serious zoonotic disease for pregnant women, with the potential for causing fetal defects. Which of the following is NOT a potential threat for human infection?
A. Oocyst from cat feces B. Uncooked pork **C. Uncooked salmon**
C. Uncooked free-range chicken E. Raw, unwashed garden vegetables

7. Because Imidocarb is used for the treatment of *Babesia canis*, while a combo of Atovaquone & Azithromycin is used for *Babesia gibsoni*; it is best to distinguish between an infection of *Babesia canis* and *Babesia gibsoni*. Which is the best, most reliable test to determine between the *Babesia* species?
- A. PCR
D. Fecal Centrifugation
- B. Serology
E. CBC & Chemistry Panel
- C. Blood Smear
8. There are many species of protozoa that cause diarrhea in cattle. Which of the following protozoa causes bloody diarrhea (bloody scours) in 21+ day old calves?
- A. *Eimeria leuckarti*
D. *Cryptosporidium parvum*
- B. *Eimeria bovis*
E. *Cystoisospora rivolta*
- C. *Eimeria tenella*
9. Which of the following protozoa infects the microvilli of intestinal cells, causing intestinal cell dysfunction?
- A. *Eimeria leuckarti*
D. *Cryptosporidium parvum*
- B. *Eimeria bovis*
E. *Cystoisospora rivolta*
- C. *Eimeria tenella*
10. During a visit to a back-yard chicken coop you notice bloody diarrhea in some the chickens. You also notice the coop has an elevated wire-mess floor, with food & water dispensers sitting on the floor. Which most exposes the chickens to coccidian (*Eimeria* sp.) infections?
- A. Elevated wire-mesh floor
- B. Food & water dispensers on the floor
11. Which of the following production methods is more likely to experience a coccidian (*Eimeria* spp.) disease outbreak?
- A. 3-year old Dairy cows on a pasture
C. 1-month old Calves on a Feedlot
- B. Free-range Chickens
12. Whether *Cryptosporidium parvum*, an Eimerian coccidian or an Isosporan coccidian that is causing diarrhea, the primary concern is _____.
- A. Anemia
D. Dehydration
- B. Paralysis
E. Respiratory distress
- C. Colitis
13. *Sarcocystis cruzi* has a typical *Sarcocystis* life cycle. It has a heteroxenous life cycle involving which of the following pairs of hosts?
- A. Felids and rodents
C. Marsupials and dogs
- B. Cattle and canids
D. Birds and cattle

Matching

Tritrichomonas foetus (feline) and *Giardia* sp. can cause diarrhea in cats. Match each of these Mucoflagellates with the appropriate association.

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| ___C___ 14. Persistent smelly diarrhea | A. <i>Tritrichomonas foetus</i> feline |
| ___A___ 15. Infective trophozoite | B. <i>Giardia</i> sp. Assemb. F |
| ___A___ 16. Large Intestine | C. Both |
| ___B___ 17. Lethargy, Weight-loss | |

Eimeria spp. and *Cystoisospora* spp. are coccidians that cause diarrhea in domestic animals. Match each of these coccidians with the appropriate association.

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|--|------------------------------|
| ___B___ 18. Two sporocysts | A. <i>Eimeria</i> spp. |
| ___C___ 19. Ingest infective oocyst | B. <i>Cystoisospora</i> spp. |
| ___A___ 20. Calf | C. Both |
| ___B___ 21. Ingest infected paratenic host | |
| ___C___ 22. Very High Host Specificity | |

Tritrichomonas foetus bovine and *Neospora caninum* are protozoans that cause abortions in cattle. Match each of these protozoa with the appropriate association.

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|---|--|
| ___A___ 23. Early abortions | A. <i>Tritrichomonas foetus</i> bovine |
| ___B___ 24. Apicomplexan | B. <i>Neospora caninum</i> |
| ___A___ 25. Sexual transmission | C. Both |
| ___B___ 26. Ingest tissue cysts from cow placenta | |

Babesia canis and *Cytauxzoon felis* are important blood protozoans of pets. Match each of these protozoa with the appropriate association.

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|----------------------------------|----------------------------|
| ___A___ 27. <i>Amblyomma</i> sp. | A. <i>Cytauxzoon felis</i> |
| ___C___ 28. Piroplasm | B. <i>Babesia canis</i> |
| ___A___ 29. Pancytopenia | C. Both |
| ___B___ 30. Greyhounds | |

Arthropods (30 points)

Multiple Choice (There is one best answer for each question.)

31. A farmer of small free-range chicken farm complains that his birds have become unthrifty and with decreased egg production, which is threatening his weekly egg sales at the farmers market. When you arrive, you notice some birds have ruffled feathers and pale wattles & combs. Before you closely inspect the chickens or the mobile coop of nest-boxes, you suspect which of the following?
- A. *Menopon gallinae* B. *Psoroptes cuniculi* C. *Dermanyssus gallinae*
D. *Knemidokoptes mutans* E. *Linognathus vituli*
32. At your cat clinic, a client brings in a recently adopted cat for its first wellness exam. On first inspection you notice that the cat has open wounds at the posterior base of the ear pinna. Later during the exam, you notice the cat vigorously scratching at the same wounds. No other signs of pruritus or alopecia are noticed. What should be at the top of your differential list?
- A. *Felicola subrostratus* B. *Notoedres cati* C. *Demodex canis*
D. *Otodectes cynotis* E. *Ctenocephalides felis*
33. It is late September and you are called out to a horse barn because very recently the horses have developed small erythemic, pruritic bumps on various parts of the body. Some of the barn hands have also complained of the same small erythemic, pruritic bumps. As you enter the barn you notice much guano on the barn rafters. Also higher up in the rafters you notice the characteristic mud/twig nests of Barn Swallows. But you also notice that the nests appear to be recently unoccupied. From all this information, what should you suspect to be the cause of the red, itchy bumps?
- A. *Bovicola equi* B. *Oxyuris equi* C. *Habronema musca*
D. *Musca autumnalis* E. *Ornithonyssus sylviarum*
34. A client brings in a recently adopted cat for it's first wellness exam. On first inspection you notice that the cat has alopecia along the margins of the ear pinna as well as some alopecia around the eyes. No other signs of alopecia are noticed. What should be at the top of your differential list?
- A. *Felicola subrostratus* B. *Notoedres cati* C. *Demodex canis*
D. *Otodectes cynotis* E. *Ctenocephalides felis*
35. Although grower & finisher pigs are one's market product, which is the most important reason to also treat sows with sarcoptic mange?
- A. Sows die more quickly from *Sarcoptes scabiei*.
B. Sows are the contact source of infection for all other pigs, starting with the piglets.
C. Feed conversion is more important in sows.
D. Quick weight-gain is most important in sows.

36. You work with a rescue group, which treats animals that have been subjected to hoarding conditions. At one such facility you find a female dog in a pen with 5 other dogs. The female dog has generalized crusting, erosions, ulcers, pustules, erythema. Practicing your Pathology, you describe the morphology as: marked subacute multifocal to coalescing hyperkeratotic, ulcerative and pustular dermatitis with deep pyoderma and cellulitis. Later during the inspection of the facilities you come across a male dog with a similar condition, but housed in a different pen. You are informed that the male dog is an offspring of the female dog. Of the 20 neglected dogs at this facility, these are the only 2 dogs demonstrating this pathology. What should be at the top of your differential list?
- A. *Demodex canis* B. *Linognathus setosus* C. *Trichodectes canis*
D. *Otodectes cynotis* E. *Sarcoptes scabiei* (var. *canis*)
37. Which of the following control measures provides the most immediate efficacy for decreasing the over-all flea population in a house environment?
- A. Treatment of pets with an Adulticide.
B. Treatment of pets with a Larvicide
C. Treatment of pets with a Larvicide and an Adulticide.
D. Vacuum carpets and upholstery
38. There are several reasons why ticks are excellent vectors. One is the biological mechanism of transstadial transmission. What is transstadial transmission?
- A. A pathogen is transmitted from the mother tick to her eggs.
B. A pathogen is transmitted from male tick to female tick during copulation.
C. A pathogen remains viable in all tick life cycle stages - from egg to larvae to nymph to adult.
D. A pathogen is transmitted from female tick to male tick during copulation.
39. Neighbors of a dairy complained to the farm manager that during the summer, when seated outside, they would frequently experience painful fly bites that they suspected were coming from his farm. The manager assured his neighbors that he was controlling flies by giving his cows an in-feed insecticide that kills developing larvae in cattle manure, and he had seen a major reduction in flies on the faces and backs of his cattle. However, the neighbors continued to experience fly bites. Which fly is likely to be the source of the neighbors' irritation?
- A. *Musca domestica* B. *Stomoxys calcitrans* C. *Musca autumnalis*
D. *Haematobia irritans* E. *Gasterophilus nasalis*
40. Which fly is a mechanical vector for pinkeye (*Moraxella bovis*) in cattle?
- A. *Musca domestica* B. *Stomoxys calcitrans* C. *Musca autumnalis*
D. *Haematobia irritans* E. *Gasterophilus nasalis*

Matching

Match the scientific name of each ectoparasite with its common name.

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|---|---------------------------------------|
| ___C___ 41. <i>Dermacentor variabilis</i> | A. Equine Stomach Bot |
| ___D___ 42. <i>Haematopinus suis</i> | B. Canine Sucking Louse (anopluran) |
| ___E___ 43. <i>Felicola subrostratus</i> | C. American Dog Tick |
| ___B___ 44. <i>Linognathus setosus</i> | D. Porcine Sucking Louse (anopluran) |
| ___A___ 45. <i>Gasterophilus nasalis</i> | E. Feline Chewing Louse (mallophagan) |

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Nematodes (80 points)

Multiple Choice (There is one best answer for each question.)

46. A nursing one month old foal presents with diarrhea, and fecal flotation shows embryonated ova. What is the most likely nematode infection causing these clinical signs?
- A. *Strongyloides westeri* B. small strongyles
C. *Trichostrongylus axei* D. *Strongylus vulgaris*
47. Most hosts of *Strongyloides* pass larvated ova in their feces except which two that pass first stage larvae in feces?
- A. humans and dogs B. humans and pigs
C. pigs and horses D. dogs and horses
48. What are the pathological changes caused by *Haemonchus contortus*?
- A. blood loss anemia and hypoproteinemia
B. gastric gland dysfunction, abomasal mucosal cell hyperplasia, increased systemic protein catabolism
C. colitis caused by emergence of larvae from the mucosa of the large intestine
D. ischemia and infarction of the arteries flowing to the large intestine, subsequent necrosis of the bowel.
49. What are the pathological changes caused by *Ostertagia ostertagi*?
- A. blood loss anemia and hypoproteinemia
B. gastric gland dysfunction, abomasal mucosal cell hyperplasia, increased systemic protein catabolism
C. colitis caused by emergence of larvae from the mucosa of the large intestine
D. ischemia and infarction of the arteries flowing to the large intestine, subsequent necrosis of the bowel.

50. What are the pathological changes caused by small strongyles (cyathostomes) in horses?
- A. blood loss anemia and hypoproteinemia
 - B. gastric gland dysfunction, abomasal mucosal cell hyperplasia, increased systemic protein catabolism
 - C. colitis caused by emergence of larvae from the mucosa of the large intestine
 - D. thromboembolism causing ischemia and infarction of the arteries flowing to the large intestine, subsequent necrosis of the bowel .
51. Heavy infections with *Haemonchus contortus* in sheep present with what set of clinical signs?
- A. pale mucous membranes, intramandibular edema, dark pasty feces
 - B. watery diarrhea, intramandibular edema, anorexia (lack of appetite)
 - C. bloody diarrhea, loss of weight, pale mucous membranes
 - D. constipation, loss of weight, jaundice
52. Large numbers of trichostrongyle infective larvae on pasture is due to what?
- A. large numbers of adult worms in grazing hosts
 - B. replication of infective stage larvae in fecal pats
 - C. adult stage worms outside of the host
53. Most trichostrongyles are host specific. An important exception is a trichostrongyle that infects the stomach of cattle, small ruminants and horses. It can cause disease in horses co-grazed with sheep that can tolerate higher levels of infection than horses. What trichostrongyle is this?
- A. *Haemonchus contortus*
 - B. *Ostertagia ostertagi*
 - C. *Trichostrongylus axei*
 - D. *Cooperia oncophora*
54. Heavy infections with *Ostertagia ostertagi* in cattle present with what set of clinical signs?
- A. pale mucous membranes, intramandibular edema, dark pasty feces
 - B. watery diarrhea, intramandibular edema, anorexia (lack of appetite)
 - C. bloody diarrhea, loss of weight, pale mucous membranes
 - D. constipation, loss of weight, jaundice
55. Arrested development by *Ostertagia* larvae in the abomasum occurs at what time for calves grazing pastures in southern states with semi-arid summer pastures?
- A. during the Spring
 - B. during the Summer
 - C. during the Fall
 - D. during the Winter
56. Treatment and control of *Haemonchus contortus* infection in small ruminants is very difficult due to what feature of this nematode?
- A. it has developed drug resistance to almost all of the current anthelmintic drugs
 - B. it is transmitted by transmammary infection
 - C. it has infective larvae that are highly resistant to cold
 - D. it has adult worm stages outside of the host that can generate infective larvae

57. Which nematode parasite of cattle has demonstrated zoonotic disease potential for infection of humans?
A. *Ostertagia ostertagi*
B. *Haemonchus placei*
C. *Habronema*
D. none of the above
58. Larval and adult stages of small strongyles (cyathostomes) in horses are found where?
A. both in the small intestine
B. adults are found in the large intestine, larvae in the small intestine
C. both are found in the large intestine
D. adults are found in the small intestine and larvae are found in muscle tissue
59. Pathological changes caused by small strongyles in horses can occur in any horse that is or has been grazing on pasture. What are these changes and how are they caused?
A. granulomatous colitis due to emergence of numerous larvae embedded in the mucosa of the large intestine
B. thromboemboli of the large intestine vasculature due to migrating larvae
C. non-healing granulomas in the skin on the face or at previous wound sites
D. gastritis caused by adult worms present on the mucosa of the stomach
60. Because of the growing threat of resistance to anthelmintic drugs by small strongyles in horses it is being recommended that horses be treated on a selected individual basis rather than one deworming program for an entire herd. This approach is thought to preserve a refugia population of worms that will not be selected for resistance. What approach is used to select which horses to treat?
A. measurement of anemia by FAMACHA
B. measurement of fecal egg count by McMasters
C. Baermann technique
61. Which nematode parasite of horses has demonstrated zoonotic disease potential for infection in humans?
A. *Oxyuris equi*
B. small strongyles
C. *Dictyocaulus arnfeldi*
D. none of the above
62. A three-year-old cat is presented to your clinic with a chronic cough, loss of weight and lack of appetite. Thoracic radiographs show density in parenchymal tissue of the lungs. Examination of sputum from the cat produced during a coughing episode shows nematode larvae with a "S" shaped tail or spine. What nematode is most likely infecting this cat?
A. *Aelurostrongylus abstrusus*
B. *Ancylostoma tubaeforme*
C. *Toxocara cati*
D. *Paragonimus kellicotti*
63. Adult stage *Ancylostoma* in dogs or cats is found at what organ site?
A. small intestine
B. large intestine
C. lungs
D. liver

64. A farm dog with the habit of eating freshly passed horse feces might be mistakenly diagnosed by fecal flotation with what parasitic nematode if the horse was infected with small strongyles?
A. hookworm (*Ancylostoma* or *Uncinaria*)
B. *Toxocara canis*
C. *Trichuris vulpis*
D. *Dirofilaria immitis*
65. A client brings you a large (10 cm or ~ 4 inches) white worm with a long tapering tail that she found in the feces of her 3 year old horse. What is the nematode that most likely fits this description and how it was found?
A. *Stongylus vulgaris*
B. small strongyle
C. *Parascaris equorum*
D. *Oxyuris equi*
66. Bowel obstruction and possible rupture can be the consequence of which nematode infection in horses 3 to 10 months of age.
A. *Dictyocaulus arnfieldi*
B. *Parascaris equorum*
C. small strongyles
D. *Oxyuris equi*
67. Ingestion of ova containing infective larvae in the life cycle of *Toxocara canis* and *Toxocara cati* in their respective hosts, the dog and the cat, can result in tracheal migration and somatic migration of the larval stage. Which route of migration leads without delay to establishment of adult stage worms usually in young animals?
A. tracheal migration
B. somatic migration
68. Infection with *Toxocara canis* and *Toxocara cati* in dogs and cats, respectively, can occur by ingestion of a paratenic or transport host (bird or rodent usually) that contains the infective larva. This route of infection leads to establishment of the adult worms without migration outside of the gut wall. It is often the source of infections seen in adult hosts. In most clinics, which host is this more common in?
A. cats
B. dogs
69. Routine treatment with anthelmintic drugs for puppies usually starts at 2-3 weeks of age, whereas for kittens it usually starts at 6 weeks of age. Why is this initial routine treatment at different ages for puppies and kittens?
A. there is transuterine infection by *Toxocara canis* in dogs but not for *Toxocara cati* in cats
B. both have major transmammary infection potential with *Toxocara*, but the prepatent time by this route in kittens is much longer
C. kittens cannot tolerate treatment with anthelmintic drugs before 6 weeks of age
70. Visceral larval migrans leading to pathological changes in the eye or brain of humans is most often caused by ingestion of infective larvae of what nematode?
A. *Ancylostoma*
B. *Strongyloides*
C. *Toxocara*
D. *Capillaria*

71. Experimentally, all mammals can be infected with *Trichinella spiralis* by feeding isolated infective larvae, but under most circumstances in nature infections are not found in herbivores (plant eaters). Why is that so?
- A. herbivore digestive tracks lack the ability to activate the infective larvae
 - B. infective larvae are found in muscle tissue
 - C. eggs containing *Trichinella* infective larvae will not hatch in herbivore digestive tracks
 - D. plant polyphenols and tannins found in herbivore digestive tracks kill infective larvae of *Trichinella*.
72. Which of the following food items presents the highest risk for infection with *Trichinella* when eaten by humans?
- A. bear meat eaten after a hunt and cooked over a campfire
 - B. frozen or well cooked pork from pigs raised in confinement with good biosecurity
 - C. beef
 - D. lamb
73. What is an important aid in diagnosing *Trichinella spiralis* infection in humans (and dogs)?
- A. presence of bipolar ova in feces
 - B. presence of bipolar ova in sputum
 - C. clinical signs of anemia
 - D. serum with antibody titers specific for *Trichinella*
74. Your client in Raleigh has a 4 year old spayed female boxer dog and has purchased a house with a sunny (no shaded areas) backyard that the previous owner fenced for his dogs. The previous owner raised two litters from a female dog that he did not have on monthly prophylaxis, and complained about having "worms" in the puppies and the female dog having bouts of bloody diarrhea. Your client would like her dog to have access to the backyard but is concerned about her dog getting infected with "worms". The house has been vacant for 3 months over the summer. What nematode presents the highest risk for establishing a patent infection with adult worms in your client's dog from being in the backyard?
- A. *Ancylostoma*
 - B. *Toxocara*
 - C. *Strongyloides*
 - D. *Trichuris*
75. *Trichuris vulpis* infections are often difficult to treat because of what two factors?
- A. reinfection from long-lived ova in the environment, and a long prepatent time with larvae in the host that are not easily killed
 - B. female worms produce large numbers of ova continuously, and a long prepatent time with larvae in the host that are not easily killed
 - C. reinfection from long-lived ova in the environment, and a very rapid development with 2 - 3 days of infective larvae in ova
 - D. adult stage *Trichuris* has developed resistance to most current anthelmintic drugs, and infective larvae in the soil can infect by skin penetration

76. In dogs adult *Capillaria* infect sites other than the intestine that present with signs characteristic for inflammation of the tissue site. Where are adult *Capillaria (Eucoleus) bohmi* found in the dog?
- A. arterial blood vessels of the lung
B. nasal mucosa
C. subcutaneous tissue
D. liver
77. Knowing that a parasitic nematode belongs to the order Spirurida informs you that the nematode life cycle requires an arthropod intermediate host. This information is important in how you proceed to prevent further infection. Which one of the following is NOT in the order Spirurida?
- A. *Physaloptera*
B. *Habronema*
C. *Trichuris*
D. *Dracunculus*
78. *Habronema* infective larvae when deposited on the surface of an open wound or near lips or eyes of a horse by feeding flies, such as *Musca*, can remain at the site and cause an eosinophil infiltrated granulomatous reaction or continue migration to establish adult worms. Where are adult *Habronema* nematodes found in the horse?
- A. mucosal surface of the stomach
B. subcutaneous nodules
C. tracheal lumen
D. small intestine
79. Which adult parasitic nematode infection of dogs and cats is readily diagnosed by endoscopic exam of the stomach?
- A. *Toxocara*
B. *Ancylostoma*
C. *Trichuris*
D. *Physaloptera*
80. What is the risk of establishing an adult worm infection of *Dirofilaria immitis* by transfusing blood from a microfilaremic dog to a non-infected dog?
- A. no risk
B. moderate risk, depending on age of recipient
C. high risk
81. Most cats diagnosed with heartworm infection are treated by which one of the following approaches?
- A. immiticide adulticide drug treatment using the same protocol as dogs
B. immiticide adulticide drug treatment as two single injections spaced one month apart
C. treat with corticosteroid in reducing doses during episodes of clinical signs, do not give immiticide, there is no safe immediate-kill drug treatment for heartworm in cats
D. do not treat with any drug, stop monthly prophylaxis treatments.

82. For all dogs having the possibility of patent infection with *Dirofilaria* the Heartworm Guidelines state that "all dogs should be tested for microfilariae". Which one below is NOT a valid reason to do microfilaria tests?
- A. microfilaremia validates antigenemia serological results
 - B. microfilaremia identifies the patient as a reservoir infection
 - C. microfilaremia alerts you to a high microfilaria burden that may precipitate a severe reaction following administration of a microfilaricidal preventative
 - D. the number of microfilariae is highly correlated with lung pathology
83. The pathology and clinical signs associated with *Dirofilaria immitis* in dogs is associated most often with which organ?
- A. heart
 - B. liver
 - C. lungs
 - D. kidneys
84. The pathology and clinical signs associated with *Dirofilaria immitis* in cats is associated most often with which organ?
- A. heart
 - B. liver
 - C. lungs
 - D. kidneys
85. Why is there no *Dirofilaria immitis* transmission among canids, domestic or wild, in central and northern Alaska even though there are many mosquitoes?
- A. only one or two species of mosquitoes will transmit *Dirofilaria immitis* and they do not exist in Alaska
 - B. *Dirofilaria immitis* larval development in the mosquito requires sustained warm temperatures to complete development before the mosquito dies
 - C. Alaskan mosquitoes do not feed on dogs
 - D. the thick hair coat of dogs in Alaska prevent mosquito bites

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Platyhelminthes (30 points)

Multiple Choice

86. Which one of the following groups do ALL the flatworms (flukes and/or tapeworms) listed result in economic loss to a cattle farmer because of condemnation of cattle meat and/or liver?
- A. *Echinococcus granulosus*, *Moniezia sp.*, *Taenia pisiformis*
 - B. *Fasciola hepatica*, *Taenia saginata*, *Fascioloides magna*
 - C. *Moniezia sp.*, *Dipylidium caninum*, *Fascioloides magna*
 - D. *Taenia solium*, *Taenia taeniaformis*, *Taenia pisiformis*
 - E. *Dicrocoelium dendriticum*, *Taenia pisiformis*, *Spirometra sp.*

87. Which one of the following is a good general statement about the life cycle of digenetic trematodes?
- A snail intermediate host is required.
 - The infective (metacercarial) stage always encysts on aquatic vegetation.
 - The miracidial stage is always aquatic: hatching from the ova and swimming to its next host.
 - The second intermediate host is always a vertebrate.
 - The adult fluke is always found in the small intestine of the definitive host.
88. Control measures for *Fasciola hepatica* may include:
- Elimination of ants and terrestrial snails
 - Elimination of aquatic snails and wet areas in the pasture
 - Prevent human defecation in pastures & human ingestion of raw meat
 - Prevent access of canids into the pasture and prevent canid access to offal
89. This lung fluke often causes respiratory signs like cough, but in rare cases it can cause acute pneumothorax and death.
- Heterobilharzia americana*
 - Nanophyetus salmincola*
 - Dicrocoelium dendriticum*
 - Paragonimus kellicotti*
 - Platynosomum fastosum*
90. The bile duct fluke of cats, _____, can cause a severe disease called "Lizard Poisoning".
- Paragonimus kellicotti*
 - Platynosomum fastosum*
 - Spirometra* sp.
 - Nanophyetus salmincola*
 - Heterobilharzia americana*
91. Dogs may be infected with the blood fluke, *Heterobilharzia americana*. What is the 2nd intermediate host of *Heterobilharzia americana*?
- Crayfish
 - Aquatic Vegetation
 - Salmon
 - Ants
 - This fluke does not use a 2nd intermediate host
92. Dogs and Cats become infected with the lung fluke, *Paragonimus kellicotti*, when they ingest a _____, that contains metacercarial larval stages.
- Crayfish
 - Bird
 - Fish
 - Rodent
 - Rabbit
93. Which one of the following is a good general statement about the life cycle of cestodes?
- A snail intermediate host is required.
 - The intermediate host is always a vertebrate.
 - There is always an aquatic larval stage, such as the coracidium.
 - Cestodes always require 3 hosts to complete their life cycles.
 - The infective larval stage must be ingested: either via the predator / prey interaction or due to accidental ingestion of the intermediate host.

94. Which one of the following groups do ALL the tapeworms listed have larval stages in humans that can cause important human diseases?
- Taenia pisiformis*, *Taenia solium*, *Taenia saginata*
 - Dipylidium caninum*, *Echinococcus granulosus*, *Spirometra* sp.
 - Taenia solium*, *Dipylidium caninum*, *Taenia saginata*
 - Dipylidium caninum*, *Taenia taeniaeformis*, *Taenia pisiformis*
 - Taenia solium*, *Echinococcus granulosus*, *Spirometra* sp.
95. The main pathology caused by adult *Taenia pisiformis* & *Dipylidium caninum* is
- Brain damage
 - Liver Necrosis
 - Segments in feces, client worry, aesthetics
 - Lung inflammation
96. Humans become infected with the adult tapeworm of *Taenia saginata* by:
- Ingesting tapeworm eggs from human feces
 - Ingesting raw beef
 - Ingesting tapeworm eggs from dog feces
 - Ingesting raw frog legs
 - Ingesting tapeworm eggs from cattle feces
97. Humans get infected with the hydatid cyst of *Echinococcus granulosus* when they ingest:
- a flea that contains the larval tapeworm.
 - the tapeworm egg from dog feces.
 - the tapeworm cysticercus from raw beef.
 - the tapeworm egg from human feces.
 - the tapeworm proceroid stage in a freshwater copepod.
98. How does a horse become infected with the tapeworm *Anoplocephala perfoliata*?
While ingesting grass (grazing), a horse inadvertently ingests a _____, which is infected with a cysticercoid larval stage.
- flea
 - caddis fly
 - rodent
 - pasture mite
 - copepod
99. Which tapeworm requires complete elimination, as this tapeworm has the ability to asexually reproduce in the host. This allows the tapeworm to repopulate the host without reinfection?
- Mesocestoides corti*
 - Spirometra* sp.
 - Moniezia expansa*
 - Platynosomum fastosum*
 - Dipylidium caninum*
100. Which one of the following canine tapeworms does NOT shed its proglottids in the host's feces? The lack of segments in the feces requires the veterinarian to utilize fecal sedimentation to diagnose this tapeworm infection.
- Taenia pisiformis*
 - Spirometra* sp.
 - Mesocestoides corti*
 - Dipylidium caninum*
 - Taenia taeniaeformis*