Name: _____KEY_____

VMP 930 -- Lecture Exam #1

(100 points total)

Multiple Choice (2 points each) (Each question has one correct answer)

1. Which protozoa has an Obligate Indirect Life Cycle where canids are definitive hosts that become infected after ingesting aborted cattle fetuses?

A. *Cystoisospora felis* B. *Toxoplasma gondii* C. *Sarcocystis cruzi*

D. *Neospora caninum* E. *Sarcocystis neurona*

2. Which flagellate can form cysts?

A. *Trypanosoma cruzi* B. *Leishmania infantum* **C. *Giardia sp.***

D. *Tritrichomonas blagburni* E. *Toxoplasma gondii*

3. A 4-year-old mixed breed dog recently moved to the US from Mexico and presents to your clinical with lymphadenopathy and fever, suggestive of an infection. A thoracic radiograph revealed an enlarged heart. You suspect a chronic *Trypanosoma cruzi* infection. Which is the best diagnostic test to confirm your suspicion?

A. PCR test from a blood sample **B. IFA serology test to detect antibodies**

C. Xenodiagnosis D. Cardiac biopsy with histology

E. Lymph node aspirate smear and microscopic examination

4. A new pig farmer is worried about a recent outbreak of scours in his 12-day old piglets. At that age you know that piglet scours can be cause be bacteria or coccidia. After performing a fecal exam, you confidently diagnose *Cystoisospora suis*. What oocyst morphological features did you see to make that diagnosis?

A. The oocyst had 2 sporocysts and no polar cap

B. The oocyst had 4 sporocysts and a polar cap

C. The oocyst had 4 sporocysts and no polar cap

D. The oocyst was very tiny and contained 4 sporozoites

E. The oocyst was very tiny and contained 2 sporozoites

5. A 4-month-old kitten presents to you for diarrhea. You ask the owner questions about the duration, consistency and frequency of the diarrhea; however, they do not know any answers to your questions and cannot describe the diarrhea. On a fresh wet-mount, you see many spindle-shaped, forward moving organisms with vigorous motility and are highly suspicious of a certain gastrointestinal protozoal pathogen. To be certain, you send a sample out for PCR and your initial suspicions are confirmed. From the options below, how will you treat this cat?

A. Metronidazole B. Clindamycin C. Atovaquone and Azithromycin

D. Ronidazole E. Probiotics and a raw diet

6. A goat cheese producer consults with you on several goats that were put down due to neurologic deficits; specifically they had developed a circling behavior. He was also concerned because several of his goats recently aborted. You notice a few cats hanging around the property. Which apicomplexan parasite do you suspect?

A. *Cytauxzoon felis* B. *Sarcocystis neurona* C. *Tritrichomonas foetus*

D. *Eimeria ovinoidalis* **E. *Toxoplasma gondii***

7. A farmer consults with you because he is seeing successive groups of his dairy calves come down with scours. You recommend several management changes, one of which includes:

A. Make sure rodents and opossums cannot get into the barn to expose the cattle to oocysts in feces

B. Make sure cats are not allowed near the calves, especially during weaning, to prevent fecal-oral contamination with infective oocysts.

C. Make sure calves are separated by age groups and treat the entire herd with coccidiostats.

D. Makes sure dogs are not eating offal around the farm and exposing the calves to infective oocyst in their feces.

E. Scrub and disinfect the barn and feeding containers with 10% bleach solution

8. Both cats and dogs can be infected with *Giardia*. The potential for transmission between these two hosts and/or their human owners is_____.

A. Unknown

B. Relatively high as it only takes a single organism to infect a susceptible host

C. Relatively high as there is little host specificity

D. Relatively low as each of these hosts is usually infected with a host-specific assemblage

E. Relatively low because *Giardia* is not very infective once it is in the environment.

9. If we start an apicomplexan life cycle with a sporozoite infecting a host cell, put the following steps in the correct order, according to a general Apicomplexa life cycle.

Start: Sporozoite infects a cell. What happens next?

A. Merogony, Sporogony, Fertilization, Gametogony

B. Sporogony, Fertilization, Gametogony, Merogony

C. Fertilization, Sporogony, Merogony, Gametogony

D. Gametogony, Sporogony, Fertilization, Merogony

E. Merogony, Gametogony, Fertilization, Sporogony

10. Babesiosis pathogenesis is due to_____ and _____.

A. Indirect destruction of white blood cells / inflammation

B. Direct destruction of splenic cells / vascular thrombi

C. Direct destruction of erythrocytes (RBCs) / Autoimmune reactions

D. Direct destruction of erythrocytes (RBCs) / vascular thrombi

E. Direct destruction of endothelial (cell that line vessels) / Autoimmune reactions

11. Which apicomplexan can cause abortions in cattle and neurological disease in puppies.

A. *Sarcocystis neurona* B. *Toxoplasma gondii* C. *Cystoisospora canis*

D. *Neospora caninum* E. *Sarcocystis cruzi*

12. US Foxhounds are commonly infected with *Leishmania infantum* via which route of transmission?

A. Vertical (transplacental) B. Sand fly bite C. Tick bite

D. Ingesting sporocysts E. Traveling overseas to other countries

13. Which parasite is transmitted to people through stercorarian transmission but often transmitted to dogs by contact with the oral mucosa?

A. *Leishmania infantum* B. *Babesia vogeli* C. *Sarcocystis cruzi*

D. *Neospora caninum* **E. *Trypanosoma cruzi***

14. On a routine fecal exam (fresh wet-mount, with light microscopy) from a healthy canine patient, you identify some protozoal organisms that look like *Giardia*. You perform a *Giardia* antigen, rapid in-house test and it is positive. What is the recommended treatment for this dog?

A. Ronidazole B. Metronidazole C. Clindamycin

D. Doxycycline **E. No treatment needed**

15. Calf scours, occurring between 7 to 14 days old, is most likely due to which protozoan parasite?

A. *Eimeria bovis* B. *Sarcocystis cruzi* **C. *Cryptosporidium parvum***

D. *Tritrichomonas foetus* E. *Cystoisospora* spp.

16. A new client contacts you with concerns about coccidiosis in his newly acquired lambs. As you outline a treatment and management plan, you warn your client about potential secondary problems that can develop due to the diarrhea and management, which include:

A. Fly strike and bacterial enteritis

B. Zoonotic infection

C. Tissue cysts forming in the sheep if the pathogen moves past the intestinal wall and becomes systemic

D. Fecal/coccidian oocyst contamination of horse feed causing serious illness in his horses

E. Chronic large bowel infection that may never resolve

17. Which one of the following potential paratenic hosts are important sources of human *Toxoplasma gondii* infections.

A. Free-range cattle B. Pigs raised in factory farm

C. Poultry raised in a factory farm **D. Free-range pigs**

E. Unpasteurized milk from dairy cattle

18. *Cystoisospora* spp. primarily infect which cells in the definitive hosts?

A. Enterocytes in the small intestines of carnivores

B. Enterocytes in the large intestines of carnivores

C. Enterocytes in the small intestines of herbivores

D. Enterocytes in the large intestines of herbivores

E. Enterocytes in poultry

19. A 6-year-old, indoor/outdoor cat presents to you with a fever, anorexia, signs of pneumonia and mild thoracic effusion. The cat is *Toxoplasma gondii* seropositive. What is the best assessment and next steps based on these results?

A. Explain to the owners that the antibodies may only represent a previous exposure to *Toxoplasma gondii* and you want to collect an aspirate of the thoracic effusion to obtain a definitive diagnosis before treating.

B. Diagnose the cat with toxoplasmosis and start a 4-week treatment with clindamycin

C. Explain to the owner the cat may have an active infection, but you want to perform serological testing in 4 weeks to see if the titers change before treating.

D. Explain to the owners that cat has toxoplasmosis and there are no medications to treat *T. gondii*. You can only provide supportive care and send him home.

E. Diagnose the cat with toxoplasmosis and explain to the owners the cat is shedding oocysts and needs to be euthanized because it is a zoonotic disease.

20. Which is the best, most reliable diagnostic test to determine the infective *Babesia* species?

A. Blood smear and microscopy B. Lymph node aspirate and microscopy

C. Serology **D. PCR test** E. Western Blot

21. Which feline protozoa infection can result severe disease, often including high fever, dyspnea, jaundice, pancytopenia, and hyperbilirubinemia?

A. *Toxoplasma gondii* B. *Babesia gibsoni* C. *Cystoisospora felis*

D. *Leishmania mexicana* **E. *Cytauxzoon felis***

22. How do cattle become infected with *Sarcocystis cruzi*?

A. ingesting oocysts from racoon feces **B. ingesting sporocysts from dog feces**

C. invertebrate tick vector D. ingesting sporocysts from opossum feces

E. ingesting oocysts from cat feces

23. How might one control *Sarcocystis neurona*?

A. Elimination of stray canids, don't feed offal / scraps to dogs

B. Fecal sanitation, coccidiostats

C. Use sanitary artificial insemination, surveillance of bulls

D. Elimination of stray felids, eliminate rodent paratenic hosts

E. Keep opossums out of feed bins, eliminate fruit trees in pastures.

24. A farmer from Nevada is complaining about having too many open cows (his cows are not getting pregnant). The farmer has 1 bull that is about 5 years old. If you can only test for 1 of the organisms listed below, which one should you test for?

A. *Neospora caninum* B. *Sarcocystis cruzi* C. *Toxoplasma gondii*

D. *Tritrichomonas foetus* E. *Trypanosoma cruzi*

25. *Cryptosporidium parvum* is a highly zoonotic infection that may result in severe diarrhea in people. Which of the following is **most likely** to be a source of infection to humans?

A. Infected calves to people **B. Contaminated pools (from infected people)**

C. Undercooked beef (from infected cattle) D. Infected pets to their owners

E. Contaminated hands after handling dirty vegetables

26. You are presented with a client's beloved indoor/outdoor cat that is recumbent, dsypnic and has a fever. After stabilizing with fluids and oxygen, you run a stat blood smear and identify large, monocytes/macrophages laden with zoites along the feathered edge of the smear. What is the **BEST** next step?

A. Along with other supportive care treatment, place a nasogastric feeding tube and start treatment with imidocarb.

B. Discuss with owners that treatment (atovaquone and azithromycin) is available with ~60% success rate if started quickly and will include a week of intensive care and support.

C. Discuss with owners that treatment (imidocarb) is available with ~60% success rate if started quickly and will include a week of intensive care and support.

D. Along with other supportive care treatment, place a nasogastric feeding tube and start treatment with atovaquone.

E. Apply tick prevention and send owners home with subcutaneous fluids to administer knowing the disease is self-limiting and the ~60% of cats will recover with some supportive care.

27. Which coccidian pathogen may result in bloody calf scours?

A. *Eimeria bovis* B. *Tritrichomonas foetus* C. *Cystoisospora* spp.

D. *Cryptosporidium parvum* E. *Eimeria ovinoidalis*

28. Cats become infected with *Tritrichomonas blagburni* by ingesting_____.

A. Rodents infected with tissue cysts
B. Trophozoites in feces/environment
C. Cysts in feces/environment
D. Attached tick vectors
E. Sporulated oocysts in feces/environment

29. If a veterinarian performs successive cultures and wet mount microscopic examinations of preputial washings from a bull, she is probably looking for which pathogen?

A. *Neospora caninum*
B. *Tritrichomonas foetus*
C. *Toxoplasma gondii*
D. *Sarcocystis cruzi*
E. *Sarcocystis neurona.*

30. You are presented with mixed-breed dog, recently adopted from a shelter in GA. The dog has several ticks attached and some old scars that appear to be from bite wounds. The dog is lethargic, febrile, and has an enlarged spleen. Evaluation of a stained blood smear revealed piroplasms inside erythrocytes. You perform a CBC. What is the most common blood abnormality typically seen with this type of protozoal infection.

A. Thrombocytopenia (low platelets)
B. Anemia (low red blood cells)
C. Neutrophilia (elevated neutrophils)
D. Lymphocytosis (elevated lymphocytes)
E. Pancytopenia (= anemia, thrombocytopenia, neutropenia)

31. A 3-year-old boxer-mixed breed presents to you because his owners claim he seems depressed and has a decreased appetite. The owners and dog live in Florida, have not traveled with the dog and adopted him 2 years ago from a rescue group that operates out of Spain. On physical examination, you note a slightly elevated temperature, lymphadenopathy, crusting around his eyes and an enlarged spleen.

Based on history and clinical signs, what might you expect to see on a lymph node cytology specimen?

A. Piroplasms inside erythrocytes
B. Amastigotes inside macrophages
C. Extracellular trypomastigotes
D. Cysts full of bradyzoites
E. Extracellular Promastigotes

32. A horse presents with asymmetrical ataxia and muscle atrophy. The veterinarian suspects that the horse is infected with a systemic apicomplexan parasite. Which of the following is the most prudent course of action?

A. Collect a biopsy of muscle and test for pathogen by PCR testing

B. Send serum and CSF samples for serological testing to confirm the suspected pathogen and treat

C. Provide supportive therapy and allow the horse to recover naturally, because the protozoal infection you suspect usually causes a self-limiting infection in an accidental host like the horse.

D. Because the protozoal infection you suspect has serious zoonotic implications, euthanize the horse, and obtain a definitive diagnosis by histology of neurological tissue.

E. Treat the horse for the suspected protozoa based solely on clinical signs.

33. If a dog mounts a strong cell-meditated immune response to an infection with *Leishmania infantum*, then the dog will likely _____.

A. Have severe cutaneous form of the disease

B. Have no clinical signs or a less severe form of the disease

C. Have a very high antibody titer

D. Die from visceral form of the disease

E. Be a Foxhound breed

34. Which apicomplexan causes severe systemic disease in cattle by direct destruction of vascular endothelial cells and muscle cells?

A. *Neospora caninum* B. *Cytauxzoon felis* C. *Toxoplasma gondii*

D. *Sarcocystis cruzi* E. *Sarcocystis neurona.*

35. A 5-year-old NM Black Lab comes into your clinic with fever, anorexia, lymphadenopathy, coughing, abdominal pain, vomiting and diarrhea. You also note edema of the extremities. The blood work indicates a thrombocytopenia and leukopenia. Serum biochemistry indicate hypoproteinemia, hypoalbuminemia, and increased liver enzyme activities. A lymph node aspirate reveals rickettsial organisms; you suspect Rocky Mountain Spotted Fever (*Rickettsia rickettsii*). Which of the following would be the primary suspect vector for RMSF?

A. *Amblyomma americanum* B. *Ixodes scapularis* C. Trichodectes canis

D. *Dermacentor variabilis* E. *Rhipicephalus sanguineous*

36. Mr. Boris Badenov, owner of Bullwinkle Pet Grooming and Boarding, LLC. complains to you that many owners have complained that their boarded dogs were sent home with ticks. Mr. Badenov insists that the dogs cannot be getting the ticks from his facility as his facility is only indoor boarding. Is Mr. Badenov correct?

A. Yes, all ticks require outdoor habitats to thrive.

B. No, *Dermacentor variabilis*, the American Dog tick, is strictly an indoor tick.

C. No, *Rhipicephalus sanguineous*, the Brown Dog tick, proliferates in indoor habitats.

37. In 1890, the Veterinary Division of the USDA's Bureau of Animal Industry reported for the first time in history that an arthropod can be a vector for a disease. The arthropod, *Rhipicephalus (Boophilus) annulatus*; the animal disease, Texas Cattle fever (*Babesia bigemina*). In 1906, the USDA created the Cattle Fever Tick Eradication Program and through a coordinated cattle dipping program (with an arsenical solution of white arsenic, soda, and pine tar) was able to eradicate Texas Cattle fever from the USA by 1954. This program was successful because *Rhipicephalus (Boophilus) annulatus* has a _____ life cycle.

A. One host B. Two host C. Three host

38. Which of the following is **not** a reason that ticks are excellent vectors for disease transmission?

A. Persistent Feeders B. Slow Feeders **C. High Host Specificity**

D. Transovarian Transmission E. Transstadial Transmission

39. Mr. & Mrs. Tweedy run a back-yard chicken farm. They call you out because they are very concerned that their chickens are very unthrifty, even anemic -- especially Ginger and Rocky. If you cannot help them with this problem; then Mrs. Tweedy has threatened to convert their barn into an automated pie machine in order to turn the chickens into pies. You first suspect fowl mites, but do not find any on the chickens. Still thinking the problem is mites, you look at the cracks and crevices of the chicken shed. For which mite are you looking?

A. *Ornithonyssus sylviarum* B. *Sarcoptes scabiei* C. *Menopon gallinae*

D. *Amblyomma americana* **E. *Dermanyssus gallinae***

40. A stray female cat is brought into your rescue clinic with much alopecia and scaly hyperkeratosis of the head and ear margins. The skin of the forehead is thickened into ridges. The cat scratches often and seems depressed. What is most likely the cause of this condition?

A. *Psoroptes cuniculi* B. *Ctenocephalides felis* **C. *Notoedres felis***

D. *Otodectes cynotis* E. *Haematobia irritans*

41 & 42. A neglected dog comes into your rescue clinic with much alopecia, much erythema, and some hyperkeratosis. While examining the dog you notice an extra foul smell, also the dog scratches quite frequently.

41. Which pair of parasites are at the top of your list?

A. *Sarcoptes scabiei* & *Demodex canis*

B. *Stomoxys calcitrans* & *Ctenocephalides felis*

C. *Psoroptes cuniculi* & *Otodectes cynotis*

D. *Trichodectes canis* & *Felicola subrostratus*

E. *Pediculus humanus* & *Phthirus pubis*

42. Regarding the neglected dog above: you do a deep skin scrape and a trichogram. You find many elongated organisms with 8 stumpy legs. What is your diagnosis?

A. *Sarcoptes scabiei* B. *Ctenocephalides felis* C. *Otodectes cynotis*

D. *Trichodectes canis* **E. *Demodex canis***

43. You are called back to Bullwinkle Dog Grooming and Boarding, LLC. Customers are now complaining about their dogs getting lice from the facility. Mr. Badenov wants you to inspect his facilities for lice. Although you don't find any lice, which of the following do you suspect is the issue?

The groomer, Natasha Fatale,

A. does not thoroughly clean up urine immediately.

B. does not clean the grooming tools between dogs.

C. does not securely cover the jar of dog snacks.

D. does not thoroughly clean up feces immediately.

E. keeps a flying squirrel in the grooming area.

44. When treating for lice, why is it important to determine what type of louse is infesting the animal?

A. Chewing lice are not killed by systemic insecticides.

B. Sucking lice are not killed by systemic insecticides.

C. Chewing lice are not killed by topical insecticides.

D. Sucking lice are not killed by topical insecticides.

45. What is the minimum number of flea bites that will cause Flea Bite Dermatitis in an allergic pet?

A. 200 B. 8 C. 27

D. 1 E. 50

46. Which of the following habitats does **not** promote flea populations?

A. Domestic Short Haired cat. B. House with plush carpeting.

C. Concrete dog runs. D. Dog house with blankets.

E. Area of shaded thick lawn.

47. Which fly can be controlled with in-feed insecticides?

A. *Bovicola bovis* B. *Stomoxys calcitrans* C. *Gasterophilus nasalis*

D. *Musca autumnalis* E. *Phormia regina*

48. Which of the following adult flies has a painful bite and feeds on blood?

A. *Stomoxys calcitrans* B. *Oestrus ovis* C. *Gasterophilus nasalis*

D. *Musca autumnalis* E. *Cochliomyia hominivorax*

49. Shrek calls you to the Swamp to examine his noble steed, Donkey; who has fainted, because large reddish-brown bots were seen in Donkey's feces. What is the bot?

A. *Cuterebra emasculator* B. *Oestrus ovis* **C. *Gasterophilus intestinalis***

D. *Hypoderma bovis* E. *Cochliomyia hominivorax*

50. Why is it important **not** to treat for *Hypoderma spp.* bots too long after the fly season?

A. One wants to kill the bots before they move from the nasal cavity into the brain.

B. Dead large bots, along with the resulting inflammation, could cause paralysis.

C. Treatment targets the feeding adult flies.

D. One wants to kill the bots before they cause serious damage to the stomach lining.

E. Treatment targets the nits which are deposited during the fly season.