



# Australian and New Zealand College of Veterinary Scientists

## Membership Examination

June 2017

## Veterinary Parasitology and Parasitic Diseases

### Paper 1

Perusal time: **Fifteen (15)** minutes

Time allowed: **Two (2)** hours after perusal

Answer **ALL FOUR (4)** questions

Answer **FOUR** questions each worth 30 marks .....total 120 marks

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# Paper 1: Veterinary Parasitology and Parasitic Diseases

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Answer all four (4) questions

1. Eosinophilia and elevated IgE levels are central features of the host response to nematode infections.

Describe the current understanding of the role of eosinophils and IgE in the host response to nematode infection. In your answer, compare the host responses to gastrointestinal nematodes and extra-intestinal nematodes. (30 marks)

2. You have been asked to characterise the epidemiology of the major helminth parasites of a poorly studied endangered wallaby. In order to meet this request, you will need to describe various aspects of the parasites' life cycles and host responses to infection.

Answer **all** parts of this question:

- a) Define the following parasitological terms and explain how **each** is useful in understanding the epidemiology and control of helminth infections:

i. prepatent period (3 marks)

ii. refugia (3 marks)

iii. hypobiosis (3 marks)

iv. resilience (3 marks)

v. resistance. (3 marks)

A number of new strongylid (i.e. bursate) nematode species have been recovered from the gastrointestinal tract of this host.

- b) How will you determine which strongylid superfamily **each** of these nematode species should be assigned to? (6 marks)

- c) Describe the likely ecology of the free-living stages of these nematodes. Include in your answer a description of how rainfall and temperature are likely to affect the level of pasture contamination with larvae of these worms. (9 marks)

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3. Infection of different host species by the same parasite can produce markedly different structural and/or functional changes in the hosts' organ systems.

Compare and contrast the structural and/or functional organ changes between host species infected with the same parasite species, as follows:

- a) *Dirofilaria immitis* infections in dogs compared with cats. (10 marks)
- b) *Toxoplasma gondii* infections in cats compared with goats. (10 marks)
- c) *Ancylostoma caninum* infections in dogs compared with people. (10 marks)

4. Ectoparasities are responsible for very significant economic losses in the Australian and New Zealand wool industries.

Describe the aetiology **and** pathophysiology of **each** of the following parasitic diseases of sheep. Include in your answer an explanation of how **each** disease produces economic losses to producers.

- a) Fly strike. (20 marks)
- b) Body louse infestations. (10 marks)

**End of paper**



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### Paper 2

Perusal time: **Fifteen (15)** minutes

Time allowed: **Two (2)** hours after perusal

Answer **ALL SIX (6)** questions

Answer **SIX** questions .....total 120 marks

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# Paper 2: Veterinary Parasitology and Parasitic Diseases

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Answer all six (6) questions. Questions carry the marks indicated (not all questions are of equal value).

1. Consider the **three (3)** most important tick species infesting cattle in Australia.

Answer **all** parts of this question:

- a) Compare and contrast the epidemiology (including geographic distribution and life cycles) of these **three (3)** tick species. *(9 marks)*
- b) Describe the clinical and economic impact of **each** of these tick species on the Australian cattle industry. *(6 marks)*
- c) Outline and justify your advice for the treatment and management of these parasites on a dairy farm. *(15 marks)*

2. An equine stud relies upon an interval treatment program to manage nematode infections; all horses are treated with an anthelmintic every 8–10 weeks. Foals are treated from eight weeks of age. The stud has relied upon an ivermectin-based product since benzimidazole-resistant cyathostomins were demonstrated several years ago. The stud now reports decreased growth rates in weaned foals. In addition, there is concern that significant faecal egg counts (mean 330 epg, range 0–925 epg) have been recorded in a group of dry mares only four weeks after their most recent ivermectin treatment.

Answer **all** parts of this question:

- a) Briefly describe the parasitological problems that might be contributing to this scenario. *(5 marks)*
- b) Design a diagnostic plan to investigate this scenario further. Include in your plan the samples that should be collected, how the samples should be stored until they reach the diagnostic laboratory, and the tests that should be performed on the samples. *(10 marks)*
- c) Outline and justify a more sustainable approach to nematode control for this property. Assume the stud has three stallions, up to 25 brood mares, and associated foals and yearlings. *(15 marks)*

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3. A new graduate seeks your advice about a parasitological problem. Her client has 20 backyard chickens of mixed breed. The chickens are housed in a predator-proof pen at night. The pen is constructed of timber and has an earthen floor. The chickens have the run of the client's yard during the day.

Four new chickens were bought three weeks ago, but one of these birds died within a week of purchase. Since then, three more birds have died after a short illness, characterised by bloody diarrhoea. The remaining birds in the flock have stopped laying eggs and another three to five birds have diarrhoea and are 'fluffed up'. The client has brought in a bird that died overnight.

There is no regular program of parasite control. The veterinarian suspects coccidiosis.

Answer **all** parts of this question:

- a) Name the species of *Eimeria* that is/are most likely to be involved in this situation. (2 marks)
  - b) Describe how to confirm your presumptive diagnosis. (3 marks)
  - c) Design **and** justify a management plan for this scenario. This advice should include both an immediate treatment plan, as well as advice to prevent a recurrence of the problem in the future. (5 marks)
  - d) Explain how the advice would differ if you were providing advice on managing this disease in a commercial flock of broiler chickens. (10 marks)
4. Consider a pruritic dog presenting to your small animal practice.

Answer **both** parts of this question:

- a) List **six (6)** parasites that may contribute to this presentation. (3 marks)
- b) Describe a diagnostic plan for determining which, if any, of the parasites you listed in the previous question 4 a) are contributing to the dog's pruritus. (7 marks)

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5. *Demodex* mites are much more frequently associated with disease in dogs, compared with other host species.

Answer **all** parts of this question:

- a) Describe the current understanding of the pathophysiology of *Demodex canis* in dogs. Your answer should make reference to the range of clinical presentations associated with this mite. (10 marks)
- b) Identify and briefly describe **two (2)** significant gaps (or untested assumptions) in the current understanding of the pathophysiology of this disease. (5 marks)
- c) Outline principles for the treatment of generalised disease due to *Demodex canis* infection. Include in your answer names of specific products for the treatment of *Demodex canis* infection. (5 marks)

6. Surra (*Trypanosoma evansi*) is an exotic disease of animals that is considered to pose a significant biosecurity threat.

Answer **all** parts of this question:

- a) Describe the clinical signs likely to be seen in acute disease due to this parasite, indicating the domestic animal species most susceptible to this form of disease. (6 marks)
- b) What is considered the **most** likely mode of introduction of this parasite to Australia? (2 marks)
- c) Briefly describe the **most** likely means of transmission of this parasite, should it establish in Australia? (2 marks)

**End of paper**