



Australian and New Zealand College of Veterinary Scientists

Membership Examination

June 2018

Veterinary Pharmacology

Paper 1

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

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

Answer **ALL SIX (6)** questions

Answer **SIX (6)** questions, each worth 20 marks total 120 marks

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Paper 1: Veterinary Pharmacology

Answer all six (6) questions

1. Describe horizontal gene transfer of antimicrobial resistance, including in your answer the roles of transformation, transduction and conjugation **and** the definitions of integrons, transposons and plasmids and the role they play in horizontal gene transfer. (20 marks)

2. Discuss structure activity relationships, which involve a binding of drug and receptor, including in your answer the following terms: (20 marks)
 - biophase
 - stimulus
 - magnitude of response
 - dose-response curves (draw examples)
 - agonists
 - antagonists
 - affinity
 - efficacy
 - potency
 - specificity and selectivity.

3. Answer **both** parts of this question:
 - a) Define the terms P-value and confidence interval. Include in your answer descriptions of their statistical and clinical significance. (12 marks)

 - b) List the advantages of using confidence intervals alongside P-values. (8 marks)

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4. In regards to a novel levamisole-abamectin combination transdermal (topical application) anthelmintic for cattle, discuss the requirements of a target animal safety study needed to complete a risk assessment to support registration of the product. (20 marks)

5. Discuss the factors affecting *in vitro* and *in vivo* drug interactions. (20 marks)

6. Good manufacturing practice (GMP), good laboratory practice (GLP) and good clinical practice (GCP) are international standards that are often used to ensure registered veterinary medicines are fit for purpose. Define **each** standard, outline its purpose **and** explain what impact **each** one has on registered veterinary medicines. (20 marks)

End of paper



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Paper 2: Veterinary Pharmacology

Answer all six (6) questions

1. You are presented with a dog with neurological signs and some gastrointestinal disturbance. The dog has a history of chewing and licking and is housed in a kennel of old, painted iron. You suspect poisoning. A blood smear shows nucleated red blood cells.

What is the likely chemical toxin? Discuss the pathogenesis of this toxin **and** devise a regime for treatment. (20 marks)
2. You are presented with a 12-year-old, 45 kg Labrador dog with chronic lameness. You would like to prescribe long-term pain relief.

Discuss the expected physiological alterations associated with this dog's age and weight **and** how they may affect the pharmacokinetics of any drugs that are administered. (20 marks)
3. You are asked to investigate a suspected lack of efficacy for a vaccine used to aid in the prevention of calf scours. A dairy herd of 400 cows was vaccinated three weeks prior to the planned start of calving. At approximately 10-days of age, 15 calves have developed severe scours. A faecal test in four calves isolated rotavirus.

The vaccine used was an inactivated vaccine containing antigens for rotavirus, coronavirus and *E.coli*. The label advises to administer the vaccine to cows three weeks prior to the planned start of calving in order to provide eight weeks of protection to the born calves.

Describe how this case should be investigated **and** identify the factors that could influence the expected clinical outcome associated with the use of this vaccine. (20 marks)
4. Describe the interactions between food and orally administered drugs that could affect absorption **and** bioavailability **and** alter the response of the drugs in companion animal patients. (20 marks)

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5. Historically, the antimicrobial recommendation was ‘to finish the course of antimicrobials even if the symptoms had disappeared’, but now, some veterinarians advise that medication should instead be administered at a higher dose and for a shorter duration. Compare and contrast both positions. *(20 marks)*

6. Compare and contrast the mechanism of action of ACE inhibitors and pimobendan in the treatment of canine congestive heart failure. Include in your answer any expected changes in heart rate and/or blood pressure as well as the overall effect on the congestive heart failure. *(20 marks)*

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