



Australian and New Zealand College of Veterinary Scientists

Fellowship Examination

June 2015

Small Animal Medicine

Paper 1

Perusal time: **Twenty (20)** minutes

Time allowed: **Four (4)** hours after perusal

Answer **ALL FIVE (5)** questions

All five questions are of equal value.

Answer **FIVE** questions each worth 48 markstotal 240 marks

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Paper 1: Small Animal Medicine

Answer all five (5) questions

1. Answer **all** parts of this question:

- a) List the anatomic components comprising the lower motor neuron (LMN) unit and describe normal neuromuscular transmission. *(14 marks)*
- b) Discuss the utility and application of electrodiagnostic studies in evaluating patients with neuromuscular disease. *(14 marks)*
- c) For **both** of the following conditions, explain the aetiopathogenesis of disease and where the primary defect in lower motor neuron transmission occurs:
 - i. feline diabetic neuropathy *(10 marks)*
 - ii. acute canine polyradiculoneuritis. *(10 marks)*

2. Answer **all** parts of this question:

- a) Describe the normal pulmonary circulation **and** outline factors that contribute to both the regulation of pulmonary arterial pressure in health, and the development of pulmonary hypertension. *(14 marks)*
- b) Outline the aetiopathogenic classification system for pulmonary hypertension and for **each** category explain the mechanism(s) that contribute to development of hypertension using disease examples. *(16 marks)*
- c) Explain the methods and principles of indirect screening tests for pulmonary hypertension. For **each** screening test identified, indicate the findings that would support a diagnosis of pulmonary hypertension. *(18 marks)*

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3. Answer **both** parts of this question:

- a) Define 'self-tolerance' **and** discuss the mechanisms that produce and maintain T and B lymphocyte tolerance in normal individuals. (30 marks)
- b) Define the terms 'molecular mimicry', 'cryptic antigens' and 'bystander effect' **and** explain how **each** of these may contribute to the development of autoimmunity. For **each** of these mechanisms, provide a unique example of an infectious disease that may trigger loss of tolerance. (18 marks)

4. Answer **all** parts of this question:

- a) Describe the anatomy of the glomerular filtration barrier **and** describe factors that determine the passage of substances across this filter. (12 marks)
- b) Outline the aetiopathogenesis **and** describe the expected diagnostic features in renal biopsy specimens for **each** of the following glomerulonephritides: (18 marks)
 - i. membranoproliferative glomerulonephritis
 - ii. amyloidosis
 - iii. hereditary nephropathy.
- c) Explain the pathogenesis of the following complications associated with protein losing nephropathies: (18 marks)
 - i. oedema
 - ii. thromboembolism
 - iii. hyperlipidaemia

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5. Answer **all** parts of this question:

a) Describe the humoral and neural afferent and efferent pathways involved in the vomiting reflex (use a diagram if necessary). Include in your answer the type and location of the neurotransmitters involved. *(22 marks)*

b) Answer **both** parts of this sub-question:

i. Explain why metoclopramide may not be as effective as ondansetron in preventing chemotherapy induced emesis in cats and dogs. *(8 marks)*

ii. Explain why maropitant may be used for motion sickness in both cats and dogs. *(3 marks)*

c) Answer **both** parts of this sub-question:

i. Describe the normal absorption of dietary vitamin B12 (cobalamin) and folate **and**, outline factors that may contribute to their deficiency. You may use a diagram if necessary. *(13 marks)*

ii. Justify the parenteral use of vitamin B12 in cases of cobalamin deficiency. *(2 marks)*

End of paper



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Answer **ALL FIVE (5)** questions

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Paper 2: Small Animal Medicine

Answer all five (5) questions

1. You are presented with a 12-year-old, male neutered, domestic shorthair cat with a one week history of lethargy, inappetence and tachypnea. The cat has previously been healthy. Physical examination identifies dull heart sounds and thoracic ultrasound confirms a pleural effusion. You collect a sample of the thoracic fluid and perform the following tests:

Pleural fluid analysis:	Result
Total protein	63 g/L
Nucleated cell count	1400 x 10 ⁶ /L
Haematocrit	<3%

Cytology:

The preparations are moderately cellular, with occasional erythrocytes and a thick granular purple proteinaceous background. Nucleated cells comprise approximately 70% non-degenerate to mildly degenerate neutrophils, 10% macrophages and 20% lymphocytes. No microorganisms or neoplastic cells are found.

Additional test results

	Result	Reference range
Serum feline coronavirus (FCoV) antibody titre	<1:10	titres 1:40 or greater are considered positive
Serum alpha-1 glycoprotein	0.68	0.1–0.48 g/L
Rivalta's test (performed on pleural fluid)	positive	

Answer **all** parts of this question:

a) Answer **both** parts of this sub-question:

- i. Outline the underlying principles for **each** of the diagnostic tests above **and** provide an interpretation of the results based upon the sensitivity, specificity and predictive values of **each** test. (16 Marks)
- ii. Discuss the underlying principles and value of any additional diagnostic tests that could be used to clarify a diagnosis of feline infectious peritonitis (FIP) in this cat. (12 Marks)

Question 1 continued over page

- b) Discuss what is meant by antibody-dependent enhancement (ADE) in the context of FIP and vaccination. (10 marks)
- c) The owner of the affected cat wants to introduce a new cat into their multi-cat household. Discuss methods of assessing the risk of FCoV transmission between the new and existing cats. (10 marks)

2. Answer **both** parts of this question:

- a) With reference to the recent literature, discuss the treatment and prognosis of **both** splenic and gastrointestinal forms of feline mast cell tumour. (16 marks)
- b) Compare and contrast prognostic factors for canine and feline cutaneous mast cell tumours. (32 marks)

3. Answer **all** parts of this question:

- a) A referring veterinarian has called you for advice on a possible endocrine case. The dog is an 11-year-old desexed male Staffordshire terrier, with a thin hair coat, comedones and a history of polyuria/polydipsia. Serum biochemistry shows mild increases in cholesterol and liver enzymes. He has elected to perform the following endocrine testing:

ACTH stimulation test		Result	Reference range
Resting cortisol	nmol/L	88	15–170
Post ACTH cortisol	nmol/L	223	<470
Thyroid function panel			
Total T4	nmol/L	10	13–42
Thyroid stimulating hormone (TSH)	ng/ml	0.03	0.02–0.5

Answer **both** parts of sub-question 3 a):

- i. Provide an interpretation of these results in light of the available information. (8 marks)
- ii. Outline what further diagnostic testing could be performed to further clarify a diagnosis of **adrenal dependent hyperadrenocorticism** in this case. (16 marks)

Question 3 continued over page

- b) Discuss what is meant by the terms ‘occult’ (or ‘atypical’) hyperadrenocorticism and ‘food-induced’ hyperadrenocorticism **and** indicate how you would reach a diagnosis for **each** of these conditions. (12 marks)
- c) With reference to the available literature, outline and justify your treatment recommendations for a dog with **pituitary dependent hyperadrenocorticism** due to a macroadenoma. (12 Marks)

4. Answer **all** parts of this question:

- a) You note a left parasternal dynamic systolic cardiac murmur when examining an otherwise clinically well, 12-month-old, male neutered Maine coon cat. Cardiac auscultation was reported to be normal at four months of age.

Answer **all** parts of this sub-question:

- i. Discuss the possible significance of the heart murmur in this cat. Indicate **and** briefly justify the most likely cause. (8 marks)
 - ii. Discuss the prognosis for the most likely cardiac disease present in this patient. (8 marks)
 - iii. Discuss additional tests that may provide more specific prognostic information for this patient. (12 marks)
- b) Discuss the potential benefits and risks of pimobendan use in cats with hypertrophic cardiomyopathy and advanced congestive heart failure. (12 marks)
- c) Discuss the use of ivabradine in pre-clinical hypertrophic cardiomyopathy. (8 marks)

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5. Answer **all** parts of this question:

a) Discuss the indications, in-clinic testing procedure, sample handling, interpretation (of both normal and abnormal test results) and limitations of the following liver function tests in dogs and cats: *(16 marks)*

i. serum bile acids

ii. plasma ammonia.

b) Kirk's Current Veterinary Therapy XV states:

'When a minimum database suggests the presence of hepatobiliary disease, the next step generally includes specific liver function tests'.

Discuss and justify your opinion on whether all dogs and cats with suspected hepatobiliary disease should undergo the liver function tests listed in 5 a) i and ii. *(8 marks)*

c) Discuss how the 'cytoprotective agents' listed below may be of benefit in the treatment of a case of canine chronic hepatitis with liver biopsy findings of lymphoplasmacytic inflammation, hepatocyte necrosis and apoptosis, bridging fibrosis and intra-hepatic cholestasis:

i. s-adenosyl-L-methionine

ii. ursodeoxycholic acid

iii. silymarin.

Include in your answer the reported mechanisms of action **and** the level of evidence available to support the use of **each** agent for chronic hepatitis in dogs. *(24 marks)*

End of paper