



Australian and New Zealand College of Veterinary Scientists

Membership Examination

June 2018

Small Animal Medicine

Paper 1

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

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

Answer **ALL FOUR (4)** questions

Answer **FOUR (4)** questions, each worth 30 marks.....total: 120 marks

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Paper 1: Small Animal Medicine

Answer all four (4) questions

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

- a) Describe the different types of erythrocytosis. Include in your answer examples of diseases that cause **each** type **and** the pathophysiological mechanisms by which they do so. (10 marks)
- b) Discuss the role of von Willebrand factor in coagulation **and** the different types of von Willebrand disease in dogs. Include in your answer the clinical signs associated with von Willebrand disease **and two (2)** breeds affected by this disease. (10 marks)
- c) Discuss the pathogenesis **and** clinical consequences of pulmonary thromboembolism in dogs. Include in your answer examples of diseases that can be associated with pulmonary thromboembolism. (10 marks)

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

- a) Describe the structure **and** function of the trigeminal nerve. Include in your answer examples of structures innervated by **each** branch of the nerve. (7 marks)
- b) Describe the clinical consequences of trigeminal neuropathies. Include in your answer examples of diseases that can cause or be associated with trigeminal neuropathies. (7 marks)
- c) Compare and contrast the neurological pathways associated with the pupillary light reflex **and** menace response. If labelled diagrams are used to illustrate your answer they should explicitly indicate any similarities or differences. (12 marks)
- d) Provide **four (4)** possible neuroanatomical locations for a lesion causing an absent right menace response with bilaterally normal pupillary light reflexes. (4 marks)

Continued over page

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

- a) Compare **and** contrast the aetiopathogenesis of canine **and** feline hypersomatotropism. (4 marks)
- b) Describe the pathophysiologic mechanisms by which hypersomatotropism causes the clinical syndrome of acromegaly in cats. (14 marks)
- c) Discuss the mechanism of action **and** list **three (3)** major adverse effects for **each** of the following immunomodulatory medications:
 - i. cyclosporine (4 marks)
 - ii. azathioprine (4 marks)
 - iii. oclacitinib. (4 marks)

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

- a) Describe the transmission of canine leptospirosis. (6 marks)
- b) List **four (4)** major body systems affected by canine leptospirosis. (4 marks)
- c) Outline **four (4)** diagnostic tests that can be used to definitively diagnose a case of canine leptospirosis. Include in your answer **one (1)** advantage **and one (1)** disadvantage of **each** test. (8 marks)
- d) Outline the safety measures that should be put in place to protect staff **and** other patients when managing a case of canine leptospirosis in hospital. (12 marks)

End of paper



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Paper 2

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

Answer **ALL FOUR (4)** questions

Answer **FOUR (4)** questions, each worth 30 marks.....total: 120 marks

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Paper 2: Small Animal Medicine

Answer all four (4) questions

1. A 12-year-old, female, neutered Maltese dog presents with a two-month history of polyuria/polydipsia and lethargy. Her appetite is reported to be good and no weight gain or loss has occurred. She has not been receiving any medications.

On physical examination, abdominomegaly is noted. All other clinical examination findings are within normal limits. A neurological examination is unremarkable.

Blood is collected for analysis. Haematology is unremarkable. Serum biochemistry, urinalysis and low-dose dexamethasone suppression test results are provided below.

Biochemistry

Parameter	Unit	Result	Reference range
Alanine transaminase	U/L	153	10–90
Alkaline phosphatase	U/L	659	20–100
Bilirubin	µmol/L	4	2–10
Urea	mmol/L	6.2	3.6–8.9
Creatinine	µmol/L	102	27–129
Calcium	mmol/L	2.45	1.8–2.8
Phosphorus	mmol/L	1.85	1.2–2.6
Glucose	mmol/L	5.7	3.9–6.3
Cholesterol	mmol/L	8.2	3.2–6.9
Sodium	mmol/L	155	142–158
Potassium	mmol/L	4.0	3.7–5.6
Chloride	mmol/L	117	110–120
Total Protein	g/L	64	58–82
Albumin	g/L	32	24–38
Globulin	g/L	34	24–48

Question 1 continued over page

Urinalysis

Collection method	Cystocentesis
USG	1.014
Colour	pale yellow
Turbidity	clear
pH	6.5
Glucose	negative
Ketones	negative
Protein	positive (++)
Bilirubin	negative
Blood	negative
WBC	negative
RBC	negative
Crystals	negative
Casts	negative
Bacteria	negative
Culture	negative

Low Dose Dexamethasone Suppression Test

Parameter	Unit	Result	Reference range
Cortisol (0 hour)	nmol/L	120	30–150
Cortisol (4 hours)	nmol/L	110	
Cortisol (8 hours)	nmol/L	128	

Answer **all** parts of question 1:

- a) Considering the clinical signs and clinicopathological abnormalities that are present in this case, create a ranked list of the **four (4)** most likely differential diagnoses **and** justify your rankings. (6 marks)

Question 1 continued over page

An abdominal ultrasound is performed in this case and the results are provided below.

Abdominal Ultrasound

Both adrenal glands are diffusely enlarged.

The caudal pole of the right adrenal gland is 6.8 mm wide.

The caudal pole of the left adrenal gland is 7.8 mm wide.

The normal width of the caudal pole of the canine adrenal gland is <5.5 mm.

The cranial pole of the left adrenal gland contains a 12 mm wide nodule.

The liver is diffusely homogeneously hyperechoic and enlarged.

No other abnormalities are detected.

- b) Based on the additional information provided by the abdominal ultrasound, create a list of potential scenarios that could explain all of the adrenal abnormalities present in this case. *(3 marks)*
- c) Discuss the sensitivity **and** specificity of an adrenocorticotropic hormone (ACTH) stimulation test, compared to a low dose dexamethasone suppression test in the diagnosis of canine hyperadrenocorticism. Include in your answer the limitations of both tests. *(7 marks)*
- d) List **five (5)** treatment options for canine pituitary-dependent hyperadrenocorticism. For **three (3)** treatment options, explain how the hypercortisolaemia is controlled **and** outline **one (1)** advantage **and one (1)** disadvantage. *(14 marks)*

Continued over page

2. A 13-year-old, female, neutered domestic shorthair cat presents with a three-month history of polyuria/polydipsia, a reduced appetite, occasional vomiting and weight loss.

Physical examination reveals poor body condition and small irregular kidneys. Systolic blood pressure by Doppler sphygmomanometer is 200 mmHg and bilateral retinal haemorrhages are noted on fundic examination. The remainder of the physical examination is unremarkable.

Haematology, biochemistry and urinalysis results are provided below.

Haematology

Parameter	Unit	Result	Reference range
Haematocrit	L/L	0.26	0.28–0.45
Red Blood Cells	$\times 10^{12}/L$	4.9	5.5–8.5
Absolute Reticulocytes	$\times 10^9/L$	10	0–60
White Blood Cells	$\times 10^9/L$	14.5	6–17
Neutrophils	$\times 10^9/L$	9.6	3–12
Lymphocytes	$\times 10^9/L$	3.7	1.5–6
Monocytes	$\times 10^9/L$	1.2	0.2–1.5
Platelets	$\times 10^9/L$	252	180–500

Biochemistry

Parameter	Unit	Result	Reference range
Urea	mmol/L	28.1	3.6–8.9
Creatinine	$\mu\text{mol/L}$	325	27–129
Calcium	mmol/L	2.65	1.8–2.8
Phosphorus	mmol/L	2.95	1.2–2.6
Glucose	mmol/L	5.7	3.9–6.3
Sodium	mmol/L	152	142–158
Potassium	mmol/L	3.9	3.7–5.6
Albumin	g/L	28	22–44
Globulin	g/L	35	24–48
Total T4	nmol/L	25	15–48

Question 2 continued over page

Urinalysis

Collection method	Cystocentesis
USG	1.014
Colour	pale yellow
pH	6
Glucose	negative
Ketones	negative
Protein	positive (++)
Bilirubin	negative
Blood	negative
WBC	negative
RBC	negative
Crystals	negative
Casts	negative
Bacteria	negative
Culture	negative
Urine protein: Creatinine ratio	0.9

Answer **all** parts of question 2:

- a) State the most likely diagnosis for this cat's clinical signs and clinicopathological findings. Explain how you would stage **and** substage this cat's disease. (4 marks)

- b) Describe an appropriate management **and** monitoring plan for this cat. (20 marks)

- c) Discuss the role of symmetric dimethylarginine (SDMA) in the diagnosis of feline chronic kidney disease. Include in your answer the advantages **and** limitations of SDMA, compared to creatinine. (6 marks)

Continued over page

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

A three-year-old, male, neutered German shepherd dog weighing 25 kilograms presents for routine evaluation and monitoring. He is fully vaccinated and fed a balanced, appropriate commercial dog food. No vomiting, diarrhoea, inappetence, weight loss or polyuria/polydipsia are reported by his owners.

At nine months of age, he was diagnosed with idiopathic epilepsy. Since that time, he has been receiving phenobarbitone (60 mg per os every 12 hours) for seizure control and has had two seizures per year.

At two years of age he was diagnosed with hip dysplasia and, for the past month, he has been receiving carprofen (50 mg per os every 12 hours) due to pelvic limb lameness.

On physical examination, bilateral wasting of the pelvic limb musculature is noted, but the remainder of the physical examination is unremarkable.

Blood is collected for analysis. Haematology is unremarkable. Serum biochemistry and urinalysis results are provided below.

Biochemistry

Parameter	Unit	Result	Reference range
Alanine Transaminase	U/L	726	10–90
Alkaline Phosphatase	U/L	931	20–100
Bilirubin	µmol/L	3	2–10
Urea	mmol/L	7.3	3.6–8.9
Creatinine	µmol/L	102	27–129
Glucose	mmol/L	5.1	3.9–6.3
Cholesterol	mmol/L	3.6	3.2–6.9
Total Protein	g/L	70	58–82
Albumin	g/L	28	24–38
Globulin	g/L	42	24–44

Question 3 continued over page

Urinalysis

Collection method	Cystocentesis
USG	1.030
Colour	yellow
Turbidity	clear
pH	6.5
Glucose	negative
Ketones	negative
Protein	negative
Bilirubin	trace
Blood	negative
WBC	negative
RBC	negative
Crystals	negative
Casts	negative
Bacteria	negative
Culture	negative

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

- i. Create a ranked list of differential diagnoses for the increased liver enzyme activities present in this case. (2 marks)
- ii. Describe your approach to managing this case, including further diagnostic investigations, monitoring **and** treatment. (12 marks)

Question 3 continued over page

- b) A ten-month-old, male, neutered French bulldog presents with a history of frequent regurgitation multiple times a day over the past two weeks. He is fully vaccinated and fed a balanced, appropriate commercial dog food.

On physical examination, he has stenotic nares, stertorous respiration and a poor body condition score. The remainder of the physical examination is unremarkable.

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

- i. Create a comprehensive list of differential diagnoses for the regurgitation in this case **and** indicate which **four (4)** you consider most likely. *(4 marks)*
- ii. Discuss an appropriate diagnostic approach to this case providing justification for your choice of tests. *(12 marks)*

4. A six-year-old, male, neutered Dobermann presents with generalised peripheral lymph node enlargement and is diagnosed with B cell lymphoma. Treatment with doxorubicin 30 mg/m² IV every three weeks is initiated.

Answer **all** parts of this question:

- a) Describe the mechanism of action of doxorubicin **and** indicate whether it is cell-cycle-phase specific or non-specific. *(2 marks)*
- b) Discuss the potential adverse effects associated with the use of doxorubicin in dogs **and** describe how these side effects can be prevented or managed, if they occur. *(20 marks)*
- c) Chemotherapeutic drugs can be excreted in body fluids, such as urine, faeces and saliva. What safety precautions should you recommend to clients to minimise their potential exposure to chemotherapeutic drug residues at home? *(8 marks)*

End of paper