



# Australian and New Zealand College of Veterinary Scientists

## Membership Examination

June 2021

### Medicine of Cats

### 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: Medicine of Cats

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Answer all four (4) questions

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

- a) Discuss the risks, to cats **and** their owners, associated with feeding cats diets that consist partially or entirely of raw meat. Include in your answer advice that you would give an owner on how to mitigate disease risks to the cat and reduce zoonotic potential to the owner. *(20 marks)*
- b) Outline the normal absorption of cobalamin (vitamin B12) in the feline intestinal tract and indicate how certain disease states might result in the development of hypocobalaminaemia. *(10 marks)*

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

- a) Briefly outline the pathophysiology of primary and secondary immune mediated haemolytic anaemia (IMHA) in cats. Include in your answer **two (2)** possible causes of secondary IMHA. *(6 marks)*
- b) List the selection criteria for feline blood donors, including the screening tests that should be performed. *(16 marks)*
- c) With reference to the feline (AB) blood typing system, outline the pathophysiological mechanism of transfusion reactions to fresh whole blood. *(8 marks)*

**Continued over page**

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

- a) List **eight (8)** defence mechanisms in healthy cats against lower urinary tract infection. *(8 marks)*
- b) Give **three (3)** examples of common bacterial pathogens in feline lower urinary tract infections **and** indicate an appropriate empirical antimicrobial choice for each bacteria listed. *(6 marks)*
- c) Discuss the biomarker symmetric dimethylarginine (SDMA). Include in your answer its use within IRIS chronic kidney disease staging guidelines and limitations of this test. *(8 marks)*
- d) Briefly explain the factors that contribute to struvite urolith formation in cats. *(8 marks)*

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

- a) Outline the pathway of sympathetic innervation of the eye in a healthy cat and explain how lesions affecting this innervation may lead to Horner's syndrome. You may use a diagram to answer this question. *(12 marks)*
- b) List the laboratory abnormalities associated with ethylene glycol toxicity and briefly explain the mechanisms by which they develop. *(12 marks)*
- c) Briefly explain why cataract formation secondary to diabetes mellitus is rare in cats compared to dogs. *(6 marks)*

**End of paper**



# Australian and New Zealand College of Veterinary Scientists

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### Medicine of Cats

### Paper 2

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 2: Medicine of Cats

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Answer all four (4) questions

1. Answer **all** parts and sub-parts of this question:

- a) A suspected feline calicivirus outbreak is occurring in a cat rescue shelter:
  - i. Outline the at-risk population, acute clinical manifestations of disease, and methods of definitive diagnosis. *(10 marks)*
  - ii. Describe the viral and population factors that allow spread of the virus within the shelter population, **and** outline appropriate control measures. *(10 marks)*
  - iii. Discuss and justify the type of vaccines and vaccination protocol that should be recommended in an outbreak situation. Include a comparison of the level of immunity and speed of onset generated by different types of vaccines. *(6 marks)*
- b) Outline the mechanism of action and indications for use of the synthetic gonadotropin-releasing hormone (GnRH) deslorelin implant in cats. *(4 marks)*

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

- a) Describe the abnormalities that might be evident on thoracic radiographs of a cat in congestive heart failure. *(8 marks)*
- b) Discuss a logical diagnostic approach to determine the cause **and** significance of a cardiac murmur in a cat. Include in your answer potential concurrent physical examination findings. *(16 marks)*
- c) List the common adverse effects of frusemide **and** indicate how you would monitor for these. *(6 marks)*

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3. A six-year-old male neutered domestic shorthair cat presents with a history of progressive lethargy and inappetence over a three-day period. All routine preventative health care is up-to-date, the cat has both indoor and outdoor access and is fed a complete and balanced commercial diet. On examination the cat is estimated to be 8% dehydrated, is quiet, alert and responsive and has a rectal temperature of 40.1°C

The following results are obtained from a complete blood count and biochemistry panel.

Parameter	Abbreviation	Units	Result	Reference range
Haematocrit	HCT	L/L	32	0.25–0.48
Red blood cells	RBC	x 10 <sup>12</sup> /L	7.4	4.9–10.0
Reticulocyte %	Retic %	%	0.2	0.0–0.4
Reticulocytes ABs	Retic	x 10 <sup>9</sup> /L	15	3–50
Haemoglobin	Hb	g/L	105	77–156
Mean corpuscular volume	MCV	fL	43	43–55
Mean corpuscular haemoglobin	MCH	pg	14	13–17
Mean corpuscular haemoglobin concentration	MCHC	g/L	328	282–333
White blood cells	WBC	x 10 <sup>9</sup> /L	<b>31.3</b>	5.5–19.0
Neutrophils		x 10 <sup>9</sup> /L	<b>28</b>	2.0–13.0
Bands		x 10 <sup>9</sup> /L	<b>0.6</b>	0.0–0.2
Lymphocytes		x 10 <sup>9</sup> /L	2.2	0.9–7.0
Monocytes		x 10 <sup>9</sup> /L	0.2	0.0–0.6
Eosinophils		x 10 <sup>9</sup> /L	0.3	0.0–1.0
Basophils		x 10 <sup>9</sup> /L	0.0	0.0–0.1
Platelet Count	PLT	x 10 <sup>9</sup> /L	Clumped and adequate	

**Comments:** Many large platelet clumps

**Question 3 continued over page**

Parameter	Abbreviation	Units	Result	Reference range
Alkaline phosphatase	ALP	U/L	42	5–50
Alanine transaminase	ALT	U/L	80	19–100
Total bilirubin	TBIL	µmol/L	4	0–7
Cholesterol	CHOL	mmol/L	3.2	2.2–5.5
Urea	UREA	mmol/L	<b>18</b>	5.0–15.0
Creatinine	CREA	µmol/L	<b>210</b>	80–200
Calcium	CA	mmol/L	2.4	2.1–2.8
Phosphorus	PHOS	mmol/L	2.0	1.0–2.3
Total protein	TP	g/L	82	60–84
Albumin	ALB	g/L	34	25–38
Globulin	GLOB	g/L	48	31–52
Albumin: globulin ratio	A:G Ratio		0.7	0.5–1.1
Glucose	GLU	mmol/L	6.0	3.2–7.5
Sodium	Na	mmol/L	148	144–158
Potassium	K	mmol/L	<b>3.4</b>	3.7–5.4
Chloride	Cl	mmol/L	112	106–123
Bicarbonate	HCO <sub>3</sub>	mmol/L	23	12–24
Sodium: potassium ratio	Na:K Ratio		<b>43.0</b>	29.0–40.0
Anion gap	AG	mmol/L	21.8	15.0–31.0
Total T4	TT4	nmol/L	30	10–60

The following results are obtained from urinalysis.

Parameter	Result
Collection method	cystocentesis
USG	1.050
Colour	yellow
Clarity or turbidity	clear
pH	6.5
Glucose	negative
Ketones	negative
Protein	negative
Bilirubin	negative
Blood	negative
Comments: Sediment examination: unremarkable	

Question 3 continued over page

Answer **all** parts of question 3:

- a) Create a problem list for this cat from the history, physical examination and laboratory test results. *(4 marks)*
  
- b) Interpret the laboratory test results and outline differential diagnoses which are relevant to the signalment, history, clinical signs and laboratory findings. *(14 marks)*
  
- c) Discuss the initial treatment that should be provided to this cat. *(4 marks)*
  
- d) List and justify further diagnostic testing for this cat. *(8 marks)*

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4. A one-year-old female neutered domestic shorthair cat presents with a history of chronic intermittent episodes of lethargy, ptyalism and generalised seizures. On examination the cat is smaller than average size for its age, has obtunded mentation and ptyalism. All routine preventative health care is up-to-date, the cat has outdoor access and is fed a complete and balanced commercial diet.

The following results are obtained from a complete blood count and biochemistry panel.

Parameter	Abbreviation	Units	Result	Reference range
Haematocrit	HCT	L/L	<b>0.23</b>	0.25–0.48
Red Blood Cells	RBC	x 10 <sup>12</sup> /L	<b>4.8</b>	4.9–10.0
Reticulocyte %	Retic %	%	0.1	0.0–0.4
Reticulocytes ABs	Retic	x 10 <sup>9</sup> /L	5	3–50
Haemoglobin	Hb	g/L	<b>76</b>	77–156
Mean Corpuscular Volume	MCV	fL	<b>34</b>	43–55
Mean Corpuscular Haemoglobin	MCH	pg	13	13–17
Mean Corpuscular Haemoglobin Concentration	MCHC	g/L	300	282–333
White Blood Cells	WBC	x 10 <sup>9</sup> /L	8.2	5.5–19.0
Neutrophils		x 10 <sup>9</sup> /L	5.2	2.0–13.0
Bands		x 10 <sup>9</sup> /L	0.0	0.0–0.2
Lymphocytes		x 10 <sup>9</sup> /L	2.2	0.9–7.0
Monocytes		x 10 <sup>9</sup> /L	0.2	0.0–0.6
Eosinophils		x 10 <sup>9</sup> /L	0.6	0.0–1.0
Basophils		x 10 <sup>9</sup> /L	0.0	0.0–0.1
Platelet Count	PLT	x 10 <sup>9</sup> /L	Clumped and adequate	

**Comments:** Many large platelet clumps.

**Question 4 continued over page**

<b>Parameter</b>	<b>Abbreviation</b>	<b>Units</b>	<b>Result</b>	<b>Reference range</b>
Alkaline phosphatase	ALP	U/L	40	5–50
Alanine transaminase	ALT	U/L	<b>115</b>	19–100
Total bilirubin	TBIL	μmol/L	4	0–7
Cholesterol	CHOL	mmol/L	<b>2.0</b>	2.2–5.5
Urea	UREA	mmol/L	<b>4.0</b>	5.0–15.0
Creatinine	CREA	μmol/L	<b>70</b>	80–200
Calcium	CA	mmol/L	2.5	2.1–2.8
Phosphorus	PHOS	mmol/L	1.6	1.0–2.3
Total protein	TP	g/L	77	60–84
Albumin	ALB	g/L	30	25–38
Globulin	GLOB	g/L	47	31–52
Albumin: globulin ratio	A:G Ratio		0.6	0.5–1.1
Glucose	GLU	mmol/L	5.0	3.2–7.5
Sodium	Na	mmol/L	148	144–158
Potassium	K	mmol/L	3.7	3.7–5.4
Chloride	Cl	mmol/L	111	106–123
Bicarbonate	HCO <sub>3</sub>	mmol/L	23	12–24
Sodium: potassium ratio	Na:K Ratio		40.0	29.0–40.0
Anion gap	AG	mmol/L	21.8	15.0–31.0
Total T4	TT4	nmol/L	20	10–60

**Question 4 continued over page**

The following results are obtained from urinalysis.

<b>Parameter</b>	<b>Result</b>
Collection method	cystocentesis
USG	1.028
Colour	yellow
Clarity or turbidity	clear
pH	6.5
Glucose	negative
Ketones	negative
Protein	negative
Bilirubin	negative
Blood	negative
Comments: Sediment examination: Moderate numbers of <b>ammonium biurate crystals</b>	

Answer **all** parts of question 4:

- a) Create a problem list for this cat from the history, physical examination and laboratory test results. *(4 marks)*
- b) Interpret the laboratory test results and outline differential diagnoses which are relevant to the signalment, history, clinical signs and laboratory results. *(12 marks)*
- c) Briefly justify further diagnostic testing in this case. *(6 marks)*
- d) Discuss the treatment options and prognosis for your major differential diagnosis. *(8 marks)*

**End of paper**