Australian and New Zealand College of Veterinary Scientists

Membership Examination

June 2021

Small Animal Medicine

Paper 1

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

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

Answer **ALL <u>FOUR (4)</u>** questions

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

Paper 1: Small Animal Medicine

Answer all four (4) questions

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

    a) Discuss the pathophysiology of heart failure secondary to pericardial effusion. *(20 marks)*

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

        i. List the common causes of pericardial effusion in dogs *(3 marks)* **and** cats *(3 marks).*

        ii. Select the **most appropriate** single diagnostic test that should be recommended for dogs *(2 marks)* **and** cats *(2 marks)* to help determine the cause of a pericardial effusion. Briefly justify each response.

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

    a) Describe the mechanisms that lead to red blood cell destruction in immune mediated haemolytic anaemia in dogs. *(15 marks)*

    b) Describe the laboratory abnormalities that are used to diagnose immune mediated haemolytic anaemia. *(15 marks)*

Continued over page

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

a) Define each phase of the normal cell cycle. You may use a diagram to illustrate your answer. *(10 marks)*

b) For **both** of the following medications: describe the mechanism of action, with reference to the cell cycle, and describe potential adverse effects of its use:

i. Vincristine *(8 marks)*

ii. Doxorubicin. *(12 marks)*

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

a) Describe the normal physiology of bilirubin metabolism, including its excretion. You may use diagrams in your answer. *(15 marks)*

b) Describe the pathophysiological processes that cause jaundice. Your answer should describe the different mechanisms that can result in jaundice, and include examples for each mechanism. *(15 marks)*

End of paper

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Paper 2

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

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Answer **ALL <u>FOUR (4)</u>** questions

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

Paper 2: Small Animal Medicine

Answer all four (4) questions

1. Describe and justify a rational diagnostic approach to chronic small bowel diarrhoea in the dog. *(30 marks)*

2. A 14-year-old, female spayed domestic shorthair cat presents for weight loss, increased appetite and increased thirst. On physical examination the cat appears well hydrated, with a heart rate of 240 beats per minute and normal respiration. The kidneys are small, non-painful and symmetrical on palpation. A small soft bladder is palpable, she has a body condition score of 3/9, an unkempt hair coat, and there is a palpable nodule over the trachea.

   Biochemistry results are on the following page:

Question 2 continued over page

Biochemistry results are as follows (abnormal results are highlighted in bold):

Parameter	Units	Results	Reference Values
Glucose (fluoride oxalate)	mmol/L	4.1	3.2–7.5
Creatinine	µmol/L	**161**	80–160
Urea	mmol/L	9.5	5.0–15.0
Phosphorus	mmol/L	1.9	1.0–2.3
Calcium	mmol/L	2.3	2.1–2.8
Calcium: phosphorus ratio		1.2	1.1–2.3
Sodium	mmol/L	155	144–158
Potassium	mmol/L	4.8	3.7–5.4
Na: K ratio		32.3	29.0–40.0
Chloride	mmol/L	113	106–123
Bicarbonate	mmol/L	21	12–24
Anion gap	mmol/L	25.8	15.0–31.0
Total protein	g/L	80	60–84
Albumin	g/L	33	25–38
Globulin	g/L	47	31–52
Albumin: globulin ratio		0.7	0.5–1.1
ALT	U/L	**135**	19–100
AST	U/L	23	2–62
ALP	U/L	**52**	5–50
GGT	U/L	1	0–5
Bilirubin – total	µmol/L	3	0–7
Cholesterol	mmol/L	5	2.2–5.5
Creatine kinase	U/L	192	64–400
Total T4	nmol/L	**142**	10–60

Haematology results were all within reference limits.
Urinalysis; 2 + protein, negative glucose, ketones and bilirubin, urine specific gravity 1.024

Answer **both** parts of question 2:

a) Evaluate the cat's kidney function based on the information provided.
(10 marks)

b) Discuss appropriate management options for this patient. Select and briefly justify the most appropriate treatment(s), and outline associated risks and benefits with each option. *(20 marks)*

Continued over page

3. A four-year-old, female spayed Terrier cross is presented for seizure activity. The patient does not have a history of seizures but has had three generalised motor seizures within the last 24 hours and has a generalised seizure during the examination. The patient was well until the last 24 hours with no pertinent, prior medical history. She is supervised at home with no known access to toxins. She lives in an urban city centre and is up to date with vaccinations, heartworm and flea prophylaxis.

Answer **all** parts of this question:

a) Outline your **immediate** therapeutic management and justify the **initial** diagnostic tests for this patient. *(10 marks)*

Question 3 continued over page

For the following questions, assume that results of diagnostic tests to date are within normal limits and the patient has responded to your initial treatment.

Twenty-four hours after the last seizure your neurological examination identifies:

Dull mentation

Subtle general proprioceptive ataxia

Normal posture

Normal postural reactions

Normal paw replacement response in right thoracic and right pelvic limbs

Absent paw replacement response in left thoracic and left pelvic limbs

Spinal reflexes normal.

Cranial Nerves:

Menace present OD (right eye)

Menace absent OS (left eye)

Pupillary light responses:

- Light in right eye, both pupils constrict
- **Light in left eye, neither pupil constricts**
- Dazzle present OD (right eye)
- **Dazzle absent OS (left eye)**

Normal palpebral reflex OU (both eyes)

Normal corneal reflex OU (both eyes)

Normal facial sensation over ophthalmic, maxillary & mandibular nerve autonomous zone L&R

Symmetrical face/ear carriage

No strabismus

No spontaneous nystagmus

Good physiological nystagmus (vestibulo-ocular reflex)

Good jaw tone

Good gag

Tongue appears symmetrical and functional

Fundic exam: within normal limits both eyes

Palpation: Mild neck pain on flexion and extension.

Nociception: Not assessed.

The remainder of the examination is within normal limits.

Question 3 continued over page

b) Interpret the available clinical and neurological examination findings to provide an appropriate neuroanatomic localisation. Explain your reasoning. *(10 marks)*

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

i. Provide a prioritised, differential diagnosis list based on the information currently available *(6 marks)*

and

ii. outline an appropriate approach to confirming your most likely differential diagnosis. *(4 marks)*

Continued over page

4. An eight-year-old female, neutered, Labrador presents with a 3-4 month history of weight loss, progressive hyporexia, polyuria and polydipsia (PU/PD). The dog is up to date with preventative health care, does not receive any medications, and there is no known access to toxins.

On physical examination the dog is in lean body condition, the abdomen is comfortable on palpation and vital signs are within normal limits. The results of haematology, biochemistry and urinalysis are provided below and on the following pages:

Haematology

Parameter	**Result**	**Reference Value**
RBC	7.88 $x10^{12}$/L	5.65–8.87
HCT	50.9 %	37.3–61.7
HGB	19.1 g/dL 191 g/L	13.1–20.5 131–205
MCV	64.6 fL	61.6–73.5
MCH	24.2 pg	21.2–25.9
MCHC	37.5 g/dL 375 g/L	32.0–37.9 320–379
RDW	17.0 %	13.6–21.7
% Retic	0.6 %	
Retic	49.6 K/μL	10.0–110.0
Retic-HGB	25.6 pg	22.3–29.6
WBC	**16.8 $x10^9$/L**	5.05–16.76
Neutrophils	**12.05 $x10^9$/L**	2.95–11.64
Lymphocytes	**0.7 $x10^9$/L**	1.05–5.10
Monocytes	**1.3 $x10^9$/L**	0.16–1.12
Eosinophils	**0 $x10^9$/L**	0.06–1.23
Basophils	0 $x10^9$/L	0.00–0.10
PLT	170 K/μL	148–484

Comments: Automated blood count

Question 4 continued over page

Biochemistry

Parameter	Units	Result	Reference Value
Glucose	mmol/L	4.11	4.11–7.95
SDMA	µg/dL	6	0–14
Creatinine	µmol/L	88	44–159
Urea	mmol/L	**2.3**	2.5–9.6
BUN/Crea		15	
Phosphate	mmol/L	1.21	0.81–2.20
Calcium	mmol/L	2.49	1.98–3.0
Total protein	g/L	**52**	52–82
Albumin	g/L	**21**	23–40
Globulin	g/L	40	25–45
ALT	U/L	**1200**	10–125
AST	U/L	**680**	10–50.0
ALKP	U/L	**516**	23–212
GGT	U/L	**20**	0–11
Total bilirubin	µmol/L	**35**	0–15
Cholesterol	mmol/L	**1.9**	2.84–8.26
Amylase	U/L	503	500–1500
Lipase	U/L	1421	200–1800
Sodium	mmol/L	146	144–160
Potassium	mmol/L	3.6	3.5–5.8
Na/K		41	
Chloride	mmol/L	**105**	109–122

Question 4 continued over page

Urinalysis

Parameter	Result	Reference interval
Collection method	free catch	
USG	1.020	
Colour	clear	
Clarity or turbidity	slightly turbid	
pH	7.0	
Glucose	negative	
Ketones	negative	
Protein	negative	
Bilirubin	2+	
RBCs	0	<5/HPF
WBCs	0	<5/HPF
Crystals	nil seen	
Casts	nil seen	
Epithelial cells	nil seen	
Bacteria	nil seen	

Question 4 continued over page

Answer **all** parts of question 4:

a) Provide an assessment of this patient considering the history, clinical examination and clinicopathological findings. Include in your answer relevant differential diagnoses. *(10 marks)*

b) The patient is referred for abdominal ultrasound (report provided below). Interpret the findings of the ultrasound report provided. *(4 marks)*

c) Assuming no cost constraints, explain and justify any further diagnostic investigation(s) indicated for this patient. Your response should include advantages and disadvantages of suggested tests or procedures, and relate your diagnostic process to relevant differential diagnoses. *(16 marks)*

Abdominal ultrasound

Liver	**There is reduced liver size** **Liver margins are irregular** **The parenchyma of the liver contains patchy hypoechoic changes**
GB	Within normal limits. Anechoic bile, small amount of sludge.
Spleen	Within normal limits. Uniform echotexture and echogenicity.
LK	Within normal limits
RK	Within normal limits
UB	Within normal limits
LADR	Within normal limits
RADR	Within normal limits
Stomach	Within normal limits - the stomach is completely empty.
Duodenum	Within normal limits
Jejunum	Within normal limits
ICJ	Within normal limits
Colon	Within normal limits
Pancreas	Within normal limits
Lymph nodes	Within normal limits
Peritoneum	Within normal limits
Other	

End of paper