Australian and New Zealand College of Veterinary Scientists

Membership Examination

June 2015

Veterinary Emergency and Critical Care

Paper 1

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

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

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

Answer **<u>FOUR</u>** questions each worth 30 marks .....total 120 marks

Paper 1: Veterinary Emergency and Critical Care

Answer all four (4) questions

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

   a) Discuss the pathophysiology of diabetic ketoacidosis. *(10 marks)*

   b) List **three (3)** common causes of hyponatraemia in diabetic ketoacidotic patients. *(3 marks)*

   c) List the complications associated with instituting insulin therapy. Briefly explain the cause of **each** complication and the clinical signs associated with it. *(12 marks)*

   d) Briefly outline the pathophysiology of nonketotic hyperglycaemic hyperosmolar syndrome. *(5 marks)*

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

   a) Define the terms:

      i. dehydration *(1 mark)*

      ii. hypovolaemia. *(1 mark)*

   b) List the abnormalities that may be found on physical examination for a patient which is:

      i. dehydrated *(3 marks)*

      ii. hypovolaemic. *(3 marks)*

   c) Outline the treatment for dehydration and for hypovolaemia. Explain why the treatment for **each** differs. *(12 marks)*

   d) List the complications associated with crystalloid fluid therapy. Provide examples of **each** complication. Discuss how you would monitor for these complications. *(10 marks)*

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

a) Outline the mechanisms through which smoke inhalation can cause respiratory distress. *(8 marks)*

b) Discuss the terms hypercapnic and hypoxaemic respiratory failure. *(12 marks)*

c) Compare the use of pulse oximetry and arterial blood gas analysis with reference to the oxygen haemoglobin dissociation curve. *(10 marks)*

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

a) Briefly outline the pathophysiology of systemic inflammatory response syndrome, disseminated intravascular coagulation and multiple organ failure. In your answer discuss how they are related. *(20 marks)*

b) List drugs used in the management of hypotension that are not responsive to adequate fluid loading. Explain the mechanism of action of **each treatment.** *(10 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</u>** questions each worth 30 marks .....total 120 marks

Paper 2: Veterinary Emergency and Critical Care

Answer all four (4) questions

1. A six-year-old female desexed Border collie weighing 20 kg presents with a four day history of vomiting, inappetence and lethargy. She has become increasingly lethargic over the past three days and she is now very weak. The results of her initial physical examination and laboratory readings are shown below.

Physical examination findings:

Heart Rate:	160 beats per minute
Respiratory rate:	35 breaths per minute
Temp:	38.8°C
mm:	icteric and tacky
CRT:	3 seconds

Moderate skin tenting

Haematology:

Parameter	Value	Normal range, units
WBC	**23.7**	6–17 x 10^9/L
LYM	4.7	1–4.8 x 10^9/L
MON	0.58	0.2–1.5 x 10^9/L
NEU	**17.7**	3–12 x 10^9/L
EOS	0.7	0–0.8 x 10^9/L
BAS	0.11	0–0.4 x 10^9/L
RBC	**8.92**	5.5–8.5 x 10^9/L
HGB	**20.7**	12–18 g/dL
HCT	**59.1**	37–55%
PLT	256	200–500 x 10^9
Blood smear	Platelet clumping present	

Question 1 continued over page

Biochemistry:

Parameter	Value	Normal range, units
ALB	39	25–44 g/L
ALP	**1565**	20–150 U/L
ALT	**1889**	10–118 U/L
AMY	1190	200–1200 U/L
tBIL	**53**	2–10 µmol/L
BUN	**23.8**	2–9 mmol/L
Ca2+	2.6	2.15–2.95 mmol/L
PHOS	1.78	0.93–2.13 mmol/L
CRE	**154**	27–124 µmol/L
GLU	3.5	3.3–6.1 mmol/L
Na+	142	138–160 mmol
K+	**2.9**	3.7–5.8 mmol/L
TP	**88**	54–82 g/L
GLOB	49	23–52 g/L
Serum colour	icteric	

Urinalysis:

Parameter	Value
USG	1.049

Blood gas analysis:

Parameter	Value	Normal range, units
pH	**7.28**	7.35–7.45
pCO2	38	35–38 mmHg
HCO_3^-	**13**	15.0–23.0 mmol/L
BE ecf	**-9.3**	0.0–6.0 mmol/L

Answer **all** parts of question 1:

a) For the clinicopathological results above, discuss your interpretation of the abnormalities. *(10 marks)*

b) Describe in detail an intravenous fluid plan for this patient for the next 24 hours. Provide details of fluid types, volumes and rates. Include in your answer any calculations made. *(10 marks)*

c) Outline your medical management of a patient in liver failure, justify your answers. *(10 marks)*

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2. A nine-year-old male desexed Poodle presents to you with pale mucous membranes and small bruises on his gums and ventral abdomen. You suspect a coagulopathy.

Answer **all** parts of this question:

a) Discuss and justify your diagnostic pathway for this patient. *(12 marks)*

Your initial results indicate prolonged clotting times. The owner found remnants of a block of rat bait in the dog's bed. You suspect that this patient has rodenticide toxicity.

b) What is the mode of action of this toxin? *(3 marks)*

The patient's initial physical examination and diagnostic findings are shown below:

Physical examination findings:

Demeanour:	weak
Heart Rate:	190 beats per minute
Respiratory rate:	95 breaths per minute
Temp:	37.8°C
mm:	pale pink
CRT:	2 seconds
SpO_2:	95% on room air
HCT:	21%

c) Describe how you would manage and provide ongoing monitoring for this patient's toxicity. *(15 marks)*

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3. A one-year-old Labrador presents to your clinic 24 hours after chewing through a packet of 24, 200 mg ibuprofen tablets. There were none left in the packet. The owner has been at work all day and has come home to find her dog lethargic and drooling. There are several piles of vomit around the house.

The initial physical examination findings are shown below:

Physical examination findings:

Demeanour:	weak but ambulatory
Heart Rate:	120 beats per minute
Respiratory rate:	30 breaths per minute
mm:	pale
CRT:	2 seconds
Temperature:	37.1°C
Abdomen:	tense

You assume that this patient is suffering from a non-steroidal anti-inflammatory overdose.

Answer **all** parts of this question:

a) Discuss the pathophysiology of this toxin. *(3 marks)*

The owner has no financial limitations.

b) Discuss in detail your diagnostic and management plan over the time frames shown below. Include in your answer the mode of action of any medications you wish to administer.

i. the first two hours after presentation *(15 marks)*

ii. the following 24 hours. *(5 marks)*

c) After 24 hours the patient's urine output is 0.4ml/kg/hr. Describe how you would manage this abnormality. *(7 marks)*

Continued over page

4. A seven-year-old desexed female Doberman presents for weakness, collapse and dyspnoea. Her gums are pale and her heart rate is 220 beats per minute. The oxygen saturation on room air is 89%.

You perform an ECG as shown below:

25mm/sec

Answer **all** parts of this question:

a) Outline the abnormalities in this ECG trace and state the arrhythmia present. *(5 marks)*

b) Discuss **three (3)** medications that can be given for this patient's arrhythmia. Outline their mode of action. *(9 marks)*

Thoracic radiographs show a severe alveolar pattern with cardiac enlargement. You suspect the patient is in congestive heart failure.

c) Discuss your therapeutic management of this patient's congestive heart failure. For any medications that you would administer, outline the mode of action. *(8 marks)*

d) Outline and justify your continued monitoring of this patient over the next 24 hours. *(8 marks)*

End of paper