

Australian College of Veterinary Scientists
Membership Examination

June 2010

Veterinary Pathology
Paper 1

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

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

Answer **all four (4)** questions.

All questions are of equal value.

Marks allotted to each question equate to the number of minutes that are suggested be assigned in answering.

Four questions: Question 1 (1 x 30 min), Question 2 (2 x 15 min), Question 3 (3 x 10 min), and Question 4 (5 x 6 min)

Paper 1: Veterinary Pathology

Answer all four (4) questions.

1. Answer **one (1)** of the following: **(30 marks)**

- a) Thrombogenesis is influenced by the following factors: endothelial injury, alterations in blood flow, and hypercoagulability. Outline how these factors affect thrombus formation. With regard to endothelial injury, include anti-thrombotic properties expressed at rest, and pro-thrombotic properties expressed once injured. Provide an example of a disease state for **each** factor that would favour thrombosis.
- b) Discuss hypersensitivity reactions. In your answer provide a definition, an explanation of categories and pathogenesis and, using specific examples, describe the gross and microscopic changes.

2. Answer **two (2)** of the following: **(30 marks total; 15 marks each)**

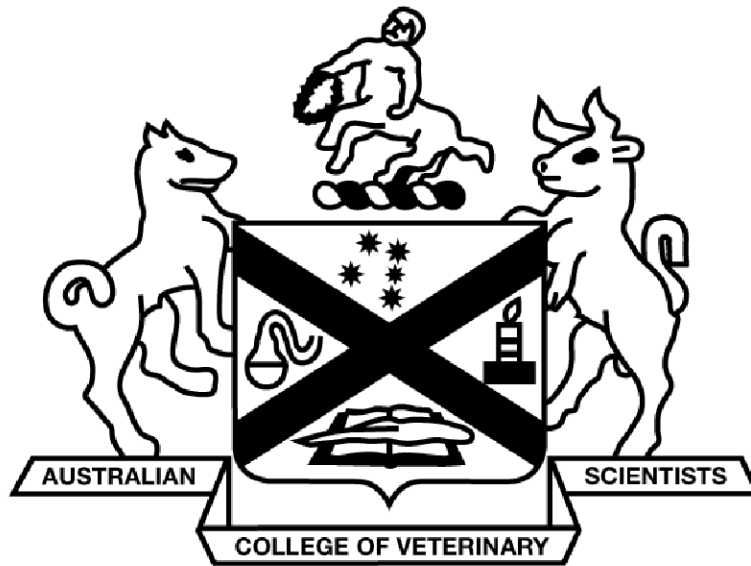
- a) In point form, outline the steps involved in the movement of leucocytes from the lumen of capillaries into the interstitial tissue. Include in your answer, the role of selectins and integrins.
- b) Define shock. Shock can be considered under three broad categories, based on a fundamental underlying problem. List **each** category, and outline their cause(s) and pathogenesis. Illustrate with specific examples for **each** category.
- c) ATP depletion, loss of calcium homeostasis, deranged cell membrane permeability, and mitochondrial damage comprise common interrelated mechanisms of cell injury. In point form, outline the cellular consequences of **each**, and related changes that may be seen microscopically.

3. Answer **three (3)** of the following: **(30 marks total; 10 marks each)**

- a) Outline the steps involved in the metastasis of tumours.
- b) Describe the phases of wound healing, including a general time frame. Provide examples of **four (4)** factors that can delay wound healing.
- c) In diagrammatic form outline the role of arachidonic acid in mediation of inflammation.
- d) Define 'free radical' and 'oxidative stress'. In point form, outline the effects that free radicals have on a cell. Provide in your answer, **two (2)** examples of processes that may generate free radicals, and **two (2)** mechanisms a cell may use to protect against free radicals.
- e) Outline the origin and composition of haemosiderin, its possible location in tissues and its microscopic appearance. List the techniques that may be used to confirm the pigment's identity. Use specific examples of disease states to illustrate your comments.
- f) In point form, list the morphologic variants of granulomatous inflammation, and for each variant note their gross and microscopic appearance, cause(s), and pathogenesis.

4. Answer **five (5)** of the following: **(30 marks total; 6 marks each)**
- a) Define the composition of amyloid and provide **three (3)** examples of different substances which can form amyloid. In point form, outline the gross and microscopic appearance of amyloid accumulation.
 - b) In point form, outline the differences in gross and microscopic appearance between glycogen and lipid accumulation within hepatocytes. Provide **one (1)** example of a cause for **each**.
 - c) Describe the pathogenesis of **two (2)** different mechanisms of ischemia-reperfusion injury.
 - d) Several viruses infecting animals have been causally linked to certain neoplasms. Provide an example of **one (1)** DNA virus and **one (1)** RNA virus capable of viral carcinogenesis. Include in your answer: the host species, tumor type and potential/likely mechanism of carcinogenesis for **each** virus.
 - e) Define the function of toll like receptors and, using **five (5)** examples, list the cell type expressing this receptor and its ligand.
 - f) In diagram form, outline the classical, lectin and alternative pathways of the complement system.
 - g) Define **each** of the following terms and give **two (2)** examples of **each**:
 - i. hypertrophy
 - ii. metaplasia
 - iii. hyperplasia.

End of paper



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Paper 2

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

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

Answer **all four (4)** questions.

All questions are of equal value.

Marks allotted to each question equate to the number of minutes that are suggested be assigned in answering.

Four questions: Question 1 (2 x 15 min), Question 2 (3 x 10 mins), Question 3 (3 x 10 mins) and Question 4 (3 x 10 mins)

Paper 2: Veterinary Pathology

1. Answer **two (2)** of the following: **(30 marks total; 15 marks each)**
 - a) A dog is presented acutely collapsed, with pale gums, a heart murmur and a PCV of 10%. Discuss various changes within the complete blood examination and biochemistry panels that may allow accurate classification of the disease process and cause, and suggest further readily available tests that may be useful.
 - b) For feline infectious peritonitis (FIP), list in point form: the gross pathological features, the characteristic histopathological changes and the clinical pathology changes. List **one (1)** antemortem test/procedure that can be used to aid in the diagnosis of FIP, and indicate its possible limitation(s).
 - c) List the hepatic histologic features of end stage liver disease in a mammalian species of your choice. List the common clinicopathological changes that occur as a consequence of liver failure in that species, and its potential effects on other organs.

2. Answer **three (3)** of the following: **(30 marks total; 10 marks each)**
 - a) When performing cytology, one objective is to differentiate between neoplastic and inflammatory processes. List the broad categories of neoplastic cell types, and features of the cytologic appearance that assist in categorization as well as classification as potentially benign or malignant. Use examples for each cell type where appropriate.
 - b) In table form, list the WHO/REAL classification of lymphoma in the dog.
 - c) List the various causes of cutaneous lesions associated with significant eosinophil infiltration in the horse, and briefly explain how they might be differentiated histologically.
 - d) Describe the gross necropsy changes associated with canine parvovirus type II infection, and **either** the histologic **or** clinical pathology findings.
 - e) Describe the gross pathological and histopathological changes in advanced ovine Johne's disease.
 - f) List the characteristic changes in **each** of the following types of leukogram, and the known or suspected reason for these changes:
 - i. inflammatory leukogram
 - ii. stress leukogram
 - iii. physiologic leukogram.

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3. Answer **three (3)** of the following: **(30 marks total; 10 marks each)**
- a) An in-house haematology analyzer indicates marked thrombocytopenia in a dog. Define mild, moderate and marked thrombocytopenia; list the mechanisms and potential causes of thrombocytopenia; and outline your advice to the vet in this case.
 - b) List at least **two (2)** species of bird that may be infected with circovirus; and with **one (1)** of these, list the expected histopathologic findings.
 - c) List expected clinical pathological findings in any **two (2)** of the following cases:
 - i. dog with hyperadrenocorticism
 - ii. cat with hyperthyroidism
 - iii. sheep with chronic copper toxicosis
 - iv. cow with acute oxalate poisoning.
 - d) Discuss how you would make a diagnosis of neosporal abortion in a bovine herd, using readily available procedures and tests.
 - e) List expected clinical pathological findings in any **two (2)** of the following cases:
 - i. horse with chronic pleuropneumonia
 - ii. sheep with pregnancy toxæmia
 - iii. dog with acute pancreatitis
 - iv. dog with hypoadrenocorticism.
 - f) Write short notes on: the epidemiology, transmission, pathogenesis and histopathological lesions of saprolegniosis in fish.
4. Answer **three (3)** of the following: **(30 marks total; 10 marks each)**
- a) List the various forms of porcine proliferative enteropathy, and in point form outline the gross and histopathological changes in each.
 - b) In point form, outline: the history, signalment, clinical signs and pathological findings that may occur secondary to *Theileria buffeli* infection in cattle.
 - c) List the information that may be gained from examination of a spun down haematocrit tube of blood taken from a dog.
 - d) In point form, outline the history/signalment and microscopic findings in cats infected with *Tritrichomonas fetus*. Also include a list of tests that may be used in diagnosis, and their limitations (if any).
 - e) List the components of a complete fluid analysis for an abdominal fluid sample in a mammalian species of your choice. For each component, outline the range of findings that allow the fluid to be characterized as a transudate, a modified transudate or an exudate.
 - f) A dairy herd is suffering an increased abortion rate and birth of weak abnormal calves. Pestivirus infection is suspected as the cause. List the readily available tests that may be used to confirm this, and their expected results.

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