



Australian and New Zealand College of Veterinary Scientists

Membership Examination

June 2012

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

Answer **FOUR** questions each worth 30 markstotal 120 marks

Paper 1: Veterinary Pathology

Answer **ALL** four (4) questions

1. Answer **one** (1) of the following: *(30 marks each)*
 - a) In response to inflammation cell membrane lipids are metabolised to form biologically active mediators derived from arachidonic acid. Describe the pathways of arachidonic acid metabolism, the metabolites produced and the major effects of these metabolites on the inflammatory response.
 - b) Describe the cellular and chemical responses of endothelial cells to inflammation.

- 2) Answer **two** (2) of the following: *(15 marks each)*
 - a) Define apoptosis. Explain the pathways by which apoptosis is initiated and the mediators involved, and describe the microscopic changes of apoptotic cells.
 - b) Chronic immune reactions are typically dominated by three subpopulations of T-helper lymphocytes. Compare and contrast Th1, Th2, and Th17 immune responses in tabulated form. Include in your table disease examples for each particular Th immune response.
 - c) Describe the tumour suppressor genes and their roles in neoplasm development.

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- 3) Answer **three (3)** of the following: *(10 marks each)*
- a) Using bullet points, describe natural killer (NK) cells. Include in your answer membrane molecules and cytokines associated with NK cells.
 - b) Draw a diagram to demonstrate the components and pathways of the complement cascade.
 - c) Outline the mechanisms whereby tumour stroma may enhance or limit tumour development and spread.
 - d) Discuss epigenetic mechanisms of altered gene expression. Include a definition of epigenetic, and the types of epigenetic changes in neoplastic cells.
 - e) In chronologic order outline common gross postmortem changes that alter carcass appearance.
 - f) Define and describe infarction. Include in your description gross and microscopic changes.

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- 4) Answer **five (5)** of the following: *(6 marks each)*
- a) Describe the gross and microscopic features of shock.
 - b) Outline, using bullet points, the steps in the process of angiogenesis.
 - c) Define and describe the gross features of the following acute inflammatory reactions:
 - i. serous inflammation
 - ii. fibrinous inflammation
 - iii. suppurative inflammation.
 - d) Using diagrams, compare and contrast the steps of first intention and second intention healing.
 - e) Describe the forms of pathologic calcification, outline the mechanisms by which calcification develops and provide examples of each.
 - f) Outline the mechanisms of oedema formation, providing examples of each.
 - g) Describe **two (2)** of the following four techniques used in molecular pathology.
(3 marks each)
 - i. polymerase chain reaction
 - ii. in-situ hybridization
 - iii. microarray analysis
 - iv. western blotting.

End of paper



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Paper 2

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

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Answer **ALL FOUR (4)** questions

All questions are of equal value

Answer **FOUR** questions each worth 30 markstotal 120 marks

Paper 2: Veterinary Pathology

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

1. Answer **two (2)** of the following: *(15 marks each)*
 - a) Describe the gross and histologic features of bovine pestivirus infection. Outline tests available for diagnosis of bovine pestivirus infection and outline advice you would provide a veterinarian for diagnosis of pestivirus infection in a bovine herd.
 - b) List, using bullet points, the expected clinicopathologic changes seen with canine hypothyroidism. Describe the tests used to diagnose canine hypothyroidism, including their possible limitations.
 - c) Describe the laboratory tests used to evaluate coagulation, discussing the components of coagulation they are examining; and outline the principles and methods of each test.

- 2) Answer **three (3)** of the following: *(10 marks each)*
 - a) Discuss the interpretation of equine endometrial biopsies.
 - b) Using bullet points, outline the aetiology, epidemiology, clinical and gross pathologic features of outbreaks of Schmallenberg virus infection.
 - c) List the gross and histologic features of sex cord stromal and germ cell neoplasms of the testis.
 - d) Discuss laboratory tests used to evaluate the liver in horses. Include examples of **two (2)** equine liver disorders and their expected clinicopathologic findings.
 - e) Discuss the pathogenesis of neonatal isoerythrolysis in a species of your choice.
 - f) Discuss the interpretation of urine sediment examination for dogs.

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- 3) Answer **three (3)** of the following: *(10 marks each)*
- a) Discuss the pathogenesis and histologic lesions of acute bovine pulmonary emphysema and oedema (also known as atypical pneumonia of cattle, or fog fever).
 - b) Define erythrocytosis; list the mechanisms and possible causes of erythrocytosis; outline other tests that may be used to evaluate the causes.
 - c) In table form outline the grading of canine soft tissue sarcomas and clinical relevance for each grade.
 - d) Discuss the mechanisms underlying the development of paradoxical aciduria with metabolic alkalosis in cattle.
 - e) For anthrax; describe the gross pathology features, specimen collection and the diagnostic test methods.
 - f) List expected clinicopathologic findings in any **two (2)** of the following:
 - i. cow with abomasal displacement
 - ii. dog with acquired Fanconi's syndrome
 - iii. cat with uncontrolled diabetes mellitus
 - iv. horse with pituitary pars intermedia dysfunction.

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- 4) Answer **three (3)** of the following: (10 marks each)
- a) Describe the pathogenesis, gross and histologic lesions of *Brachyspira hyodysenteriae* infection of pigs.
 - b) Discuss the histologic and immunohistochemical features of canine cutaneous round cell tumours.
 - c) Outline, using bullet points, the common erythrocyte morphologic features seen on blood films from clinically normal horses, goats, deer and camelids.
 - d) Discuss the various techniques that may be used to obtain material for cytological evaluation. List the common artefacts that may be observed in preparations from the material referred to a diagnostic laboratory by a veterinary practitioner.
 - e) Discuss the importance of quality control and quality assurance in a diagnostic laboratory.
 - f) List the gross pathologic and histologic features of **two (2)** of the following:
 - i. abalone viral ganglioneuritis
 - ii. rabbit haemorrhagic disease
 - iii. chytridiomycosis of frogs
 - iv. paramyxovirus in pigeons.

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