



Australian and New Zealand College of Veterinary Scientists

Fellowship Examination

June 2015

Veterinary Aquatic Animal Health Paper 1

Perusal time: **Twenty (20)** minutes

Time allowed: **Three (3)** hours after perusal

Answer **ALL FOUR (4)** questions

All four questions are of equal value.

Answer **FOUR** questions each worth 45 markstotal 180 marks

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Paper 1: Veterinary Aquatic Animal Health

Answer all four (4) questions

1. Describe acute and chronic inflammation in teleost fish by identifying the components as well as the sequence of events **AND** highlight the key differences between these inflammatory processes in teleost fish and molluscs. (45 marks)

2. Answer **all** parts of this question: (45 marks)
 - a) Explain the mechanisms of osmoregulation in freshwater teleost fish and marine molluscs.

 - b) Define biofilms in intensive aquaculture production systems and discuss their pros and cons in such systems.

 - c) Explain the impact of direct lifecycle parasites on cultured aquatic species giving examples.

 - d) Describe how osmoregulation and the excretion of nitrogenous waste products occurs in elasmobranchs.

3. The discipline of diagnostic microbiology is important in many investigations of morbidity and mortality within aquatic animal populations.
List and discuss the key differences between aquatic animal diagnostic microbiology and those of routine mammalian animal diagnostic microbiology. (45 marks)

4. Intensive aquaculture relies heavily upon artificial breeding techniques to maintain broodstock numbers and the availability of juvenile stock for grow out to market. (45 marks)
 - a) **Describe** the key anatomical and physiologic features with respect to reproduction of an example from teleost, mollusc and crustacean culture systems.

AND
 - b) **Discuss** the environmental, management and market considerations for hatchery production of juvenile aquaculture stock including examples of manipulative techniques used in the various culture systems.

End of paper



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Veterinary Aquatic Animal Health Paper 2

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Paper 2: Veterinary Aquatic Animal Health

Answer all four (4) questions

1. For **both** of the following **two (2)** scenarios: (45 marks)
 - a) Discuss how you would investigate the events.
 - b) List the differential diagnoses in order of probability. For **each** diagnostic possibility give details of the gross pathology, histopathology, and ancillary diagnostic test results for all of your differential diagnoses that you would consider confirmatory for that diagnosis.
 - c) Outline treatment options for **each** diagnosis. Include in your answer detailed information on problems that are likely to be encountered with treating, or consequences of treatment that you would consider important.
 - d) Discuss the mitigation strategies you would advise for the system manager.

Scenario 1: An occurrence of sudden death of 95% of the fish in a well-established marine 1000 L aquarium. The aquarium contains a mix of soft corals, anemone and reef fish. No new fish had been introduced for at least six months. Weekly water testing parameters performed by the owner leading up to this event included non-detectable concentrations of ammonia and nitrite, with nitrate around 50–80 ppm. The aquarium was located in the basement of a three-story house with minimum fluctuation in temperature.

Scenario 2: High mortalities have been occurring in cage cultured marine fish. This is the latest in a series of events that have occurred intermittently over the last six months. Fish are found dead at the surface, some with opercula flare and mouth gaping.

Continued over page

2. Answer **both** parts of this question: (45 marks)
- a) Discuss the value and possible limitations of histopathology in the diagnosis of diseases in aquatic animals.
 - b) Discuss the role of molecular diagnostic assays, such as polymerase chain reaction (PCR), for the diagnosis of infectious diseases in wild and cultured crustaceans.
3. Explain how you would attempt to identify the cause of the following disease presentations: (45 marks)
- a) Skeletal malformations in Barramundi with otherwise normal growth and mortality rates.
 - b) Fin rot in crustaceans.
 - c) Skin tumours in wild and farmed fish.
 - d) Ascites, oedema and gill pallor in farmed salmonids.
4. Discuss the vaccination of aquaculture species against important infectious agents in Australia and New Zealand giving details of vaccination programs, application methods, and target agents. Outline the commercial considerations when advising the use of vaccine programs to commercial aquaculture producers. (45 marks)

End of paper