



Australian and New Zealand College of Veterinary Scientists

Membership Examination

June 2012

Medicine and Management of Aquaculture Species

Paper 1

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

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

Answer your choice of any **FOUR (4)** questions from the five questions **ONLY**

All questions are of equal value

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

Paper 1: Medicine and Management of Aquaculture Species

Answer four (4) questions from five questions only.

1. A multi-species mortality event has occurred in an estuary at the end of a long, hot, dry summer. A low dissolved oxygen event caused by a phytoplankton bloom is suspected of having caused the mortalities. Answer **all** subparts of this question:
 - a) Outline the anatomical and physiological features and responses of gills that may have contributed to the mortality event. *(10 marks)*
 - b) Indicate what influence the size of fish might have on their chance of survival. *(5 marks)*
 - c) Discuss how other aquatic phyla such as crabs survive. *(5 marks)*
 - d) Note any water chemistry parameters/factors that could have contributed to the severity of the event. *(10 marks)*

2. Diseases caused by herpesviruses have caused massive mortalities in Australian pilchards and abalone in the last 15 years. In **both** instances the disease was previously undetected. Answer **both** subparts of this question.
 - a) Briefly discuss what this suggests about the epidemiology/origin of these diseases. *(10 marks)*
 - b) Compare and contrast the immune system of finfish and molluscs and suggest what might be the long term impact of these diseases in infected wild populations. *(20 marks)*

3. Compare and contrast the osmoregulation of freshwater finfish and crustacea. Briefly outline how disruptions of osmoregulation might be diagnosed in each species and what might be the causes of such disruption. *(30 marks)*

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4. Ammonia and nitrite are important water quality parameters for aquaculturists. Answer **both** subparts of this question.
- a) Explain the factors that determine the relative amounts of these chemicals in aquaculture water (both seawater and freshwater) and how these chemicals affect the health of aquatic animals. (25 marks)
 - b) Explain briefly how the species and/or culture system concerned can affect the relevance of some of the factors you have discussed above. (5 marks)
5. Briefly describe (in point form) the aetiological agent, critical epidemiological factors, clinical presentation, diagnostic techniques and control measures of **five (5)** of the following: (6 marks each)
- a) white spot syndrome virus disease in *Penaeus monodon*
 - b) *Zeuxapta seriolae* in yellowtail kingfish
 - c) *Ichthyophthirius multifiliis* in rainbow trout
 - d) bonamiosis in oysters
 - e) microsporidiosis in crustaceans
 - f) furunculosis in salmonids.

End of paper



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Paper 2

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

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

Answer **ALL FIVE (5)** questions

In some questions you must choose which subparts to answer

All questions are of equal value

Answer **FIVE** questions each worth 24 markstotal 120 marks

Paper 2: Medicine and Management of Aquaculture Species

Answer ALL five (5) questions

1. Discuss the interaction of veterinary intervention in marine finfish farming with the environment and food safety. What issues, considerations and alternatives are possible for the control of parasitic and bacterial disease in such aquaculture systems?
(24 marks)

2. For **one (1)** of the following, discuss the further investigations and analyses you would undertake and the general control or management strategies that might be considered to alleviate low grade mortality that has continued for several weeks:
(24 marks)
 - a) Koi in an ornamental plastic lined pond in which histological and bacteriological investigations have identified *Aeromonas hydrophila* as the most likely main cause of the mortalities.

OR

 - b) Prawns in an earthen pond in which histological and bacteriological investigations have identified *Vibrio harveyi* as the most likely main cause of the mortalities.

3. You have been contacted by a farmer producing Pacific oysters (*Crassostrea gigas*) intertidally, in a bay containing a number of oyster farms. The farmer is concerned with the amount of dead shell they are seeing during the current grading. Explain how you would approach this scenario. In your answer explain how the information you could gather might influence your assessment and what differential diagnoses you might consider; detail how you might further investigate potential causes and what advice you might provide. (24 marks)

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4. Answer **either** (a) or (b) **only** (24 marks each)

- a) An aquarium shop with 60 aquaria that sells a variety of freshwater tropical ornamental fish to the public has asked for some help with designing and implementing a water management plan and treatment plan for the fish. The shop obtains stock from a wholesale business and local hobbyists. The fish have recently had mortalities and been diagnosed with tetrahymenosis and chilodonellosis. Outline some of the key considerations and recommendations that you would make to manage disease in such a business.

OR

- b) Outline a biosecurity plan for a *Penaeus monodon* prawn hatchery.

5. Answer **four (4)** from the following five subparts: (6 marks each)

- a) A fantail goldfish is swimming weakly on its side on the surface of the water. Describe the possible causes.
- b) A freshwater crayfish has heavy external fouling. Outline the underlying factors that might cause or contribute to this problem. Suggest some possible treatment/management options.
- c) Outline some possible control and management measures for QX disease (*Marteilia sydneyi*) in oysters.
- d) Barramundi in a sea cage are flashing. Outline the possible causes and how you would investigate the problem on site.
- e) Name an enzootic disease of aquatic animals that is reportable in Australia or New Zealand. You have just diagnosed the disease or strongly suspect the presence of the disease. Outline what you would do and the likely outcomes if it is present. Discuss why some enzootic/endemic diseases are reportable/notifiable.

End of paper