



# Australian and New Zealand College of Veterinary Scientists

## Membership Examination

June 2015

## Medicine and Management of Laboratory Animals

### Paper 1

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

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

Answer **ALL FOUR (4)** questions

Answer **FOUR** questions each worth 30 marks .....total 120 marks

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# Paper 1: Medicine & Management of Laboratory Animals

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Answer all four (4) questions

1. Discuss the impact of variability of noise, light, temperature, humidity and ventilation on laboratory rodents. Include in your answer acceptable ranges for laboratory rodents, potential sources of variability **and** how this variability can be controlled. *(30 marks)*
  
2. For **each** of the following:
  - a) pin worm infestations in mice *(10 marks)*
  
  - b) mite infestations in rats *(10 marks)*
  
  - c) chronic respiratory disease in rats. *(10 marks)*

list the:

- causative organism(s)
  
- impact on the animal
  
- potential impact on research activity
  
- diagnosis and treatment.

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3. Answer **both** parts of this question:
- a) List the epidemiology, clinical signs, impact on research, prevention and treatment of norovirus infection in mice. *(10 marks)*
  - b) Discuss the aetiology, clinical signs, treatment and prevention of:
    - i. pododermatitis in rabbits *(10 marks)*
    - ii. pregnancy toxemia in ewes. *(10 marks)*
4. Answer **both** parts of this question:
- a) For **each** of the following scenarios, list **all** the **acceptable** euthanasia methodologies including the routes of administration. Identify your recommended method **and** justify the reasons for this preference **and** why the others are not preferred? *(15 marks)*
    - i. a rabbit at the end of a polyclonal antibody raising program
    - ii. the culling of 200 overstocked mice from a breeding colony
    - iii. the euthanasia of a sheep for collection of the heart for muscle physiology studies.
  - b) For a colony of genetically modified mice:
    - i. Define homozygous breeding and heterozygous breeding. *(5 marks)*
    - ii. Discuss the advantages **and** disadvantages of homozygous breeding versus heterozygous breeding. *(10 marks)*

**End of paper**



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### Paper 2

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Answer **ALL FOUR (4)** questions

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# Paper 2: Medicine & Management of Laboratory Animals

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Answer all four (4) questions

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

- a) A New Zealand white rabbit from a production colony of rabbits was transported to an experimental research facility two weeks ago. Today it was found to be depressed, anorexic and, when examined, was noted to have lost weight since it left the production facility.

Answer **both** parts of this sub-question:

- i. List the steps involved in investigating this problem. *(8 marks)*
- ii. List the differential diagnosis **and** recommended treatments for **each** differential diagnosis. *(7 marks)*
- b) You are an advisor to an animal facility housing rats, mice, guinea pigs and rabbits. List the work health and safety hazards for an animal attendant performing basic husbandry duties under the headings: physical, chemical and biohazards.
- Explain the control measures that you could apply to reduce the risk of exposure to **each** of these hazards. *(15 marks)*

2. A new research facility houses laboratory animals used for PC2 and PC3 work. It is located in a high fire and earthquake risk region. You have been asked to develop a disaster plan for this facility.

Discuss this plan addressing pre-emptive, immediate and post-incident responses and considering building standards, human and animal safety and survival, ethical and legal compliance issues. *(30 marks)*

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

- a) Describe your recommendations for upgrading a conventional animal facility to house both nude and severe combined immune deficiency (SCID) mice. The animals will be used for experiments requiring daily access but will not be used for breeding.

Include in your recommendations:

- housing requirements (5 marks)
- equipment (5 marks)
- husbandry needs (5 marks)
- operations and management considerations. (5 marks)

- b) Assuming the nude and SCID mice discussed in part 3 a) will be supplied from interstate suppliers:

- i. List the key requirements when transporting mice. (5 marks)
- ii. Discuss the risk factors to the welfare of the nude and SCID mice when transporting by plane. (5 marks)

4. A manager of a six holding room specific pathogen free (SPF) mouse research facility breeds and maintains Balb/c mice, nude mice, two imported knockout strains and three transgenic lines developed specifically for researchers. The mice are held in individually ventilated caging (IVC). The colony conducts routine serology and bacterial screening every three months. At the most recent screening mouse hepatitis virus (MHV) was detected.

Answer **all** parts of this question:

- a) List the possible causes of the MHV appearance in the colony. (5 marks)
- b) Briefly describe the measures that need to be implemented in order to avoid MHV infection in the future. (5 marks)
- c) Describe the 'replace or rederive' protocol as it relates to the mouse strains held in this facility. (5 marks)
- d) List the methods available for rederivation of mice colonies. Briefly discuss the advantages **and** disadvantages of **each**. Identify the optimal method of rederivation and justify your choice. (15 marks)

**End of paper**