



# Australian and New Zealand College of Veterinary Scientists

## Membership Examination

June 2019

## Animal Reproduction 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: Animal Reproduction

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Answer all four (4) questions

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

- a) Describe the pathogenesis, clinical signs and diagnosis of bovine freemartinism. *(15 marks)*
- b) Compare and contrast ovariectomy, ovariohysterectomy and hysterectomy in the bitch. In your answer, discuss the techniques used and possible consequences of each procedure. *(15 marks)*

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

- a) Based on the normal physiology of parturition, explain the pharmacological options available for inducing parturition in late-gestation cows. Include in your answer how these drugs may be used most effectively. *(22 marks)*
- b) List potential complications associated with the induction of parturition in cows. *(8 marks)*

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

- a) Describe the cellular processes in production of normal, motile spermatozoa, capable of fertilising an oocyte in the female tract, from spermatogonia through to ejaculation. *(15 marks)*
- b) Describe the clinical examination techniques and findings during oestrous monitoring of the mare, and explain how you would decide on the most suitable time for successful artificial insemination (resulting in a pregnancy) with frozen semen. *(15 marks)*

**Continued over page**

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

- a) Discuss the factors that predispose or lead to uterine infection in domestic animals. Include in your answer the common causative agents, a discussion on timing and route of infections, and defence mechanisms of the reproductive tract. *(20 marks)*
  
- b) List the findings, based on history or diagnostic investigations, which would support a conclusion that functional ovarian tissue is present in a bitch of uncertain sterilisation status. *(10 marks)*

**End of paper**



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## Paper 2

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

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Answer **ALL FOUR (4)** questions

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

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# Paper 2: Animal Reproduction

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Answer all four (4) questions

1. You are planning to perform oestrous synchronisation in a group of Boer goat does for the purpose of fresh embryo transfer, using the protocol outlined below. The does have been divided into two groups: donors and recipients.

Answer **both** parts of this question:

- a) Explain the following components of the synchronisation protocol provided on the next page:
- i. The use of teaser bucks from days -18 to -7. In your answer, discuss the management of does prior to buck introduction and the time of year during which this technique would be most effective. *(6 marks)*
  - ii. The application of CIDR's in both donors and recipients from days 0 to 15. *(3 marks)*
  - iii. The use of exogenous FSH in donor does over days 12 to 16. *(3 marks)*
  - iv. The use of eCG in recipient does on day 15. *(3 marks)*

**Question 1 continued over page**

## Synchronisation Protocol

Day	Donors		Recipients	
	AM	PM	AM	PM
-18	Introduce teaser bucks to donors and recipients			
-7	Remove teaser bucks from donors and recipients			
0	Insert CIDRs		Insert CIDRs	
12	FSH			
13	FSH	FSH		
14	FSH	FSH		
15	FSH	FSH, Remove CIDRs	eCG, Remove CIDRs	
16	FSH	Detect heat, possible mating		
17	Mating	Mating		
18	Possible mating			
19				
20				
21				
22				
23	Flush embryos		Deposit embryos	

**Key:**

AM Morning

PM Afternoon

CIDR Eazi-breed® controlled internal drug-releasing device (CIDR) sheep and goat (Zoetis, Australia)

FSH 45IU follicle stimulating hormone (FSH; Folltropin®, Vetoquinol, France)

eCG 200IU equine chorionic gonadotrophin (eCG; Pregnecol®, Vetoquinol, France)

**Question 1 continued over page**

- b) The owner of a small goat dairy is interested in oestrous synchronisation and artificial insemination in his herd of 40 Saanen does, as a means of improving conception rates and compacting the kidding season. The farmer lost his previous buck to an acute disease six months ago. He has obtained a new buck that is due to arrive within the next few weeks.

Briefly outline how you would advise the farmer regarding management of this herd, including the new buck, in order to maximise conception rates. Include in your answer a discussion of the advantages and disadvantages of natural mating compared to artificial insemination techniques in these goats. *(15 marks)*

2. A client presents her five-year-old Australian Shepherd bitch to you for oestrous monitoring and fresh semen artificial insemination.

Answer **both** parts of this question:

- a) Explain how you would monitor the oestrous cycle in this bitch so that you can perform two to three inseminations at the appropriate time. *(10 marks)*

At four weeks post-breeding, you perform abdominal ultrasound for pregnancy diagnosis. At this examination, you identify a single foetus.

- b) Discuss the risks associated with a singleton foetus and explain how you would manage this case to maximise the chance of a successful outcome, given that both the foetus and bitch are valuable to the owner. In your answer, include information on how you would predict possible whelping dates and how you would monitor the bitch for impending parturition. *(20 marks)*

**Continued over page**

3. A five-year-old Quarter horse stallion has been bred to 20 Quarter horse mares during this breeding season. All mares have been hand served. All mares have been bred on at least three oestrous cycles. Five out of the 20 mares covered are confirmed pregnant.

Answer **all** parts of this question:

- a) Outline an appropriate investigation of subfertility in this group of mares. *(10 marks)*
- b) Outline an appropriate examination, including methods of semen collection and aspects of semen evaluation, to assess fertility in this stallion. *(10 marks)*
- c) The investigation reveals the stallion is failing to ejaculate when hand served. Outline how this stallion's breeding could be managed to increase pregnancy rates. In your answer, assume that assisted reproduction methods are possible. *(10 marks)*

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4. You are called to visit a beef cattle property. The owner runs a small Gelbvieh stud consisting of 21 breeders and 1 mature bull, alongside 130 head of Angus. The farm uses a restricted, summer breeding season. No pregnancy diagnoses were performed prior to calving. Calving rates (number of live calves born within a group over the total number of females in that group) for the Gelbvieh herd for the 2016 and 2017 breeding seasons, are shown in the table below:

<b>Calving rate</b>		
	<b>2016</b>	<b>2017</b>
<b>Mature cows</b>	4/7	2/7
<b>Heifers</b>	7/14	6/14
<b>Total</b>	11/21	8/21

Answer **all** parts of this question:

- a) List factors that should be considered when investigating the low calving rates reported in this herd. (10 marks)

During your visit to the property, you notice a young Angus calf showing signs of ill-thrift and diarrhoea. Screening for bovine viral diarrhoea virus (BVDV) strongly suggests that this calf is persistently infected with the virus.

- b) Discuss an appropriate plan for further investigation of BVDV infection on this property, and provide options for the management of BVDV on this farm. In your answer, consider that the farmer may have cost constraints. (15 marks)
- c) The farmer advises that he would prefer to avoid the cost of BVDV vaccinations. Discuss the potential implications of this strategy and options to manage disease risk in the herd without vaccination. (5 marks)

**End of paper**