UNIVERSITY OF KWAZULU-NATAL

SCHOOL OF AGRICULTURAL SCIENCES & AGRIBUSINESS

DISCIPLINE OF ANIMAL & POULTRY SCIENCE

EXAMINATIONS: 14 NOVEMBER 2011

SUBJECT, COURSE AND CODE: ANIMAL SCIENCE 370

DURATION: 3 HOURS **TOTAL MARKS: 100**

External Examiner: Dr H Lambrechts
Internal Examiner: Dr NC Tyler

STUDENTS ARE REQUIRED, IN THEIR OWN INTERESTS, TO WRITE LEGIBLY

PLEASE NOTE: THIS PAPER CONSISTS OF THREE (3) PAGES. PLEASE SEE THAT YOU HAVE THEM ALL.

ANSWER ALL SEVEN (7) QUESTIONS

Question 1 (Total 10 marks)

A sheep farmer would like to shift his breeding season to be able to supply lamb to his local butcher at Easter, when typically prices will increase due to the high demand in his area.

This, however, means that he will need to breed sheep in the non-breeding season.

a) Describe a way in which the farmer could ensure this, in his seasonally polyoestrous breed, and explain the mode of action [5]

b) Describe how breeding could be manipulated to ensure that all his lambs are of uniform weight at Easter [5]

Question 2 (Total 10 marks)

The following is an excerpt from a scientific paper:

"Differences in reproductive characteristics between Angus (temperate *Bos taurus*) and Brahman (tropical *Bos indicus*) cattle include longer gestation length and shorter and less intense oestrus in Brahman vs Angus females. In addition, puberty occurs at an older age and twinning rate is much lower in *Bos indicus* cattle."

Explain if, and how, any of the **abovementioned factors** could be manipulated to improve the reproductive characteristics of *Bos indicus* cattle. [10]

Question 3 (Total 13 marks)

The use of sexed-semen is now a commercially viable option for dairy farmers to skew the gender ratios of calves to result in a majority of heifers born.

a) Explain the different properties of the X- and Y-bearing spermatozoa, and describe how these have led to various methods to allow for separation of X- and Y-bearing spermatozoa populations. [8]

b) What are the major drawbacks of using sexed semen? [2]

c) What other technologies are available to manipulate gender ratios in the offspring of dairy cows? [3]

Question 4 (Total 9 marks)

A beef farmer has a specific breeding season in his herd of 500 cows, and solely uses artificial insemination in an attempt to improve the genetics in his herd.

a) Describe an advantage and a disadvantage of having a closed breeding season. [2]

b) At the end of the breeding season, there are 280 pregnant animals, and he has used 600 straws of semen on these cows, but 730 straws altogether. What is the *true services per conception* figure? [2]

c) What is the conception rate? [2]

d) From the information given, what suggestions do you have for the farmer to improve reproductive efficiency in his herd? [3]

Question 5 (Total 12 marks)

A horse stud in South Africa is looking to employ someone to assist with all aspects of foaling/breeding, and they have asked you to assist in creating a newspaper advert. This person will only be required during the busy months – so it will not be a full-time position but rather a 6 month contract position

a) Create an advert (so set out your answer as the newspaper advert) that explains some of the tasks this person will probably need to assist with as well as the expected dates of the contract. [4]

b) Explain the physiological mechanism in the horse that is the reason behind why the position is only a 6 month contract and not a full time position. [8]

Question 6 (28 marks)

In a **species of your choice**:

a) Draw an annotated diagram of the female reproductive tract, indicating barriers to the movement of sperm. [10]

b) Describe the type of placentation. [2]

c) Describe the mechanism behind maternal recognition of pregrancy and state the length of gestation. [5]

d) Describe two methods of determine pregnancy. [4]

e) Describe the hormonal profile near to the time of parturition [3]

f) Describe one disease that causes any form of reproductive failure. Include the causative organism, symptoms, prevention methods and treatment. [4]

Question 7 (Total 18 marks)

Are the following statements true or false? **Provide an explanation**.

a) It is not possible to have an ovulatory-sized follicle on the ovary at the same time as a functional corpus luteum [3]

b) A beef cow that has lost her calf, but is allowing a fostered calf to suckle will not show lactational anoestrus. [3]

c) Increasing the amplitude of the LH pulse will result in a higher frequency multiple births in sheep [3]

d) Cloning is a reproductive technology that can maintain genetic variation [3]

e) Nutritional management can be utilised as a means of superovulation [3]

f) A cow with follicular cysts may display continuous signs of oestrus, but does not ovulate. [3]