Answer **FOUR** questions each worth 30 marks .....................................................total 120 marks
Paper 1: Animal Reproduction

Answer all four (4) questions

1. Answer both parts of this question:

   a) Describe the process of gender differentiation during embryological development, resulting in the chromosomal, gonadal and phenotypic features of the male eutherian mammal. Your answer should address the following headings in dot-point form:

   i. Chromosomal gender. (4 marks)

   ii. Gonadal gender and development of the male gonad. (10 marks)

   iii. Phenotypic gender, describing development of the male accessory sex glands and external genitalia. (10 marks)

   b) Answer both of the following:

   i. Describe what is meant by the term karyotype. (4 marks)

   ii. Describe a clinical situation in which this test may be used. (2 marks)

Continued over page
2. Answer both parts of this question:

a) Gonadotrophin releasing hormone (GnRH), luteinising hormone (LH), oestradiol and prostaglandin F2α are all hormones with important reproductive functions. Describe each of these four (4) hormones under the following two (2) headings, highlighting any important differences between males and females:

i. Location of synthesis and storage. (8 marks)

ii. Reproductive function. (12 marks)

b) Provide a diagram of the bovine oestrous cycle to illustrate follicular waves and follicle development. Mark on the diagram, and support with brief notes in dot point form, the hormones involved at the different stages of follicle development. (10 marks)

3. Puberty is an important stage of reproductive development. Describe puberty in the bovine utilising the following headings:

a) Define puberty in both the male and female bovine. (5 marks)

b) Describe the reproductive events leading to, and during, puberty in the female and male bovine. (15 marks)

c) List factors affecting the onset of puberty in cattle and provide an indication of their relative importance. (10 marks)

4. Maternal recognition of pregnancy is necessary in most domestic species if pregnancy is to be maintained:

a) Define what is meant by maternal recognition of pregnancy. (2 marks)

b) Describe the mechanisms of maternal recognition of pregnancy in each of the following: cow, sow, mare and alpaca. (24 marks)

c) With regard to maternal recognition of pregnancy, why is the bitch different from all other species? (4 marks)

End of paper
1. Briefly discuss each clinical condition listed in the subsections below (each worth a total of 10 marks), under the headings:
   - Aetiology (1 mark)
   - Diagnosis (4 marks)
   - Differential diagnoses (2 marks)
   - Treatment (2 marks)
   - Prognosis (1 mark)

   a) Ovarian remnant syndrome in the bitch. (total 10 marks)

   b) A mare that shows signs of oestrus every few days for three weeks in September. (total 10 marks)

   c) Penile haematoma in the bull. (total 10 marks)

2. Answer both of the following:

   a) The accurate timing of ovulation is critical to obtaining pregnancies in the bitch associated with frozen-thawed semen insemination. With regard to breeding bitches with frozen-thawed semen:

      i. List methods associated with the monitoring of oestrus that are considered useful for the timing of artificial insemination with frozen-thawed semen in the bitch. (4 marks)

      ii. For each method that you list in part a i) above, provide brief descriptions for each of the assessment criteria and how they relate to ovulation. (8 marks)

      iii. What is the optimal site of deposition of frozen-thawed semen in the bitch (1 mark) and list three (3) insemination techniques whereby this can be achieved (3 marks).

Question 2 continued over page
b) With regard to methods used for the termination of pregnancy in the mare:

i. State the length of gestation  \((2 \text{ marks})\)

ii. Provide:

- A list of pregnancy termination techniques. \((2 \text{ marks})\)
- An outline of the timing of the termination treatment in relation to stage of gestation. \((2 \text{ marks})\)
- A dot-point description of the mode of action for each termination technique. \((8 \text{ marks})\)

3. If you wish, you may use a table format to assist you in answering this question. With regard to pregnancy diagnosis in the bitch, cow and mare:

a) List techniques used for pregnancy diagnosis. \((6 \text{ marks})\)

b) For each species, state the duration of gestation during which pregnancy diagnosis is effective for each technique listed in 3 a). \((6 \text{ marks})\)

c) List the advantages and disadvantages of pregnancy diagnosis for each technique listed in 3 a). \((18 \text{ marks})\)

Continued over page
4. With regard to the condition of pyometra:

a) Define pyometra. \((2 \text{ marks})\)

b) Answer each point below:

i. Discuss the aetiology of pyometra in the bitch \textbf{and} cow. \((6 \text{ marks})\)

ii. Discuss the signalment, history, clinical signs and diagnosis of pyometra in the bitch \textbf{and} cow. \((10 \text{ marks})\)

iii. Discuss treatment options for pyometra in the bitch \textbf{and} cow. \((8 \text{ marks})\)

iv. Discuss the prognosis for pyometra (with regard to systemic health of the female and for future fertility) in the bitch \textbf{and} cow. \((4 \text{ marks})\)

\textbf{End of paper}