



Australian and New Zealand College of Veterinary Scientists

Membership Examination

June 2019

Veterinary Radiology (Large Animal) Paper 1

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

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

Section A: Answer **ALL TWO (2)** questions

Section B: Answer **ALL FOUR (4)** questions

Section C: Answer **ALL TEN (10)** questions

Section C is multiple choice and requires the completion of **ten (10)** multiple choice questions located in the answer booklet that has been provided to you. *(Sample provided in this paper)*

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Section A: **TWO (2)** essay-type questions, each worth 30 marks..... total 60 marks

Section B: **FOUR (4)** short-answer questions, each worth 10 marks..... total 40 marks

Section C: **TEN (10)** multiple choice questions, each worth 2 marks..... total 20 marks

Paper 1: Veterinary Radiology (Large Animal)

SECTION A

Answer both questions in Section A

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

- a) Discuss the radiation safety risks specific to personnel involved in equine practice **and** identify the reasons why these risks are generally greater than those in small animal practice. *(10 marks)*
- b) Describe, in detail, the radiation safety procedures that should be employed in order to adhere to the as low as reasonably achievable (ALARA) principles of radiation safety for all personnel when radiographing the stifle of a racehorse in a training stable. *(20 marks)*

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

- a) Discuss the indications for myelography in the horse. *(10 marks)*
- b) Describe what is considered to be best-practice technique for performing radiographic myelography to further investigate an ataxic two-year-old colt suspected of having cervical vertebral malformation. Standing, plain radiographs have already been taken. Include in your answer patient management, patient positioning, radiographic projections, radiographic technique and any additional equipment required. *(20 marks)*

Section B over page

SECTION B

Answer all four (4) questions in Section B

1. Improved latitude is a major advantage of digital radiography over traditional film-screen systems.

Answer **all** parts of this question:

- a) Define latitude, in the context of radiography. (2 marks)
- b) Explain briefly how digital systems achieve better latitude. (4 marks)
- c) Describe briefly the benefits of increased latitude in digital systems. (4 marks)

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

- a) Outline, with the aid of a diagram, the production of an X-ray photon within the X-ray tube/generator. (6 marks)
- b) For both of the following, state the effect in the X-ray tube **and** the effect this has on the X-ray beam:
 - Increased kVp (2 marks)
 - Increased mA (2 marks)

Section B continued over page

3. Answer **both** parts of this question:
- a) State the type and frequency of **one (1)** transducer which would be appropriate for each of the following clinical situations:
- i. Evaluation of acute colic in a broodmare. *(1 mark)*
 - ii. Evaluation of 'bowed tendon' in a racehorse. *(1 mark)*
- b) Describe the features of **each** of the transducers chosen in question 3 a) that make them appropriate for the stated purpose. Identify, if relevant, any limitations of the selected transducer for each scenario. *(8 marks)*
4. Define the photoelectric effect and explain why it is desirable, from the point of view of film quality. *(10 marks)*

Please complete Section C in provided answer booklet

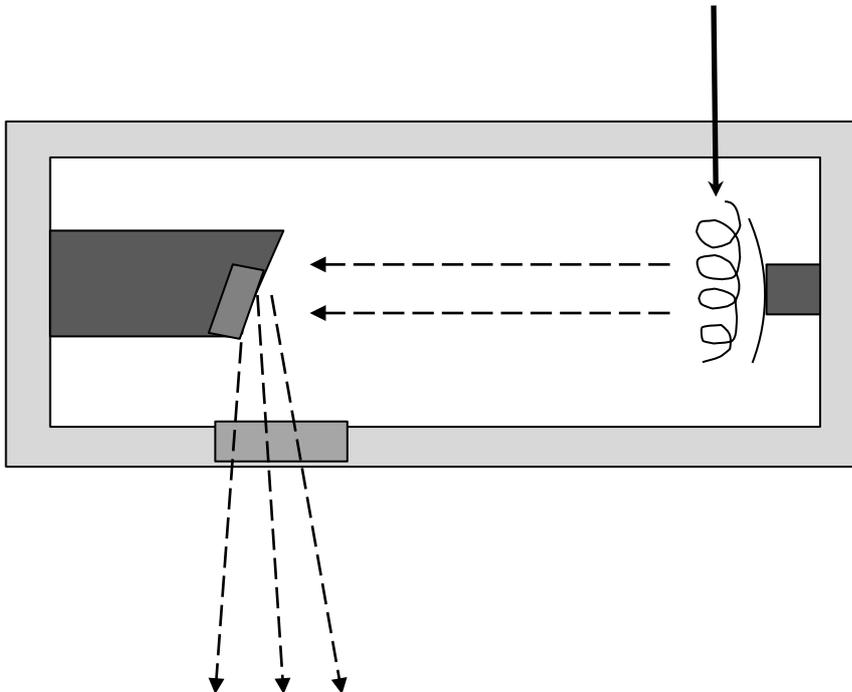
Paper 1: Veterinary Radiology (Large Animal)

SECTION C

Answer all ten (10) questions on the examination paper. This section is worth 20 marks. Each question is worth two (2) marks. Circle the letter corresponding to your chosen answer. There is no negative marking.

(10 multiple choice questions will be part of this examination located in a separate answer booklet that will be provided. Two examples for each paper have been made available.)

1. In the diagram below, which of the following options is the correct name for the component of an X-ray tube indicated by the solid arrow? (2 marks)



- a. tungsten target
- b. anode
- c. tube port
- d. cathode filament

2. Which of the following actions can a radiographer take to reduce the amount of scatter radiation produced by a patient? (2 marks)
- a. collimate the beam
 - b. reduce mAs
 - c. use a grid
 - d. increase kVp

End of paper



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Paper 2

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Section A: Answer **ALL TWO (2)** questions

Section B: Answer **ALL FOUR (4)** questions

Section C: Answer **ALL TEN (10)** questions

Section C is multiple choice and requires the completion of **ten (10)** multiple choice questions located in the answer booklet that has been provided to you. *(Sample provided in this paper)*

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Section A: **TWO (2)** essay-type questions, each worth 30 marks..... total 60 marks

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Section C: **TEN (10)** multiple choice questions, each worth 2 marks..... total 20 marks

Paper 2: Veterinary Radiology (Large Animal)

SECTION A

Answer both questions in Section A

1. A polo pony has sustained a penetrating wound to the dorsal aspect of its fetlock. Compare the advantages and disadvantages of positive contrast arthrography and fistulography to determine whether the wound communicates with the fetlock joint. In your discussion, include a detailed description of each technique. *(30 marks)*

2. Answer **both** parts of this question:
 - a) Describe the process and radiographic signs of primary intention (direct) and secondary intention (indirect) bone healing, and discuss the factors that affect fracture healing type. *(15 marks)*

 - b) Describe the radiographic signs of the most likely complications to fracture healing in **each** of the following scenarios:
 - a compound, metacarpal bone fracture in a calf repaired with a plate and screws *(10 marks)*

 - a non-displaced type 2 fracture of the distal phalanx in an adult horse. *(5 marks)*

Section B over page

SECTION B

Answer all four (4) questions in Section B

1. Osteochondrosis is a disease that affects many species, including cattle.

Answer **both** parts of this question:

- a) Briefly describe the pathophysiology (**not** the cause/s) of osteochondrosis. (5 marks)
- b) List the radiographic features of osteochondrosis of the bovine stifle. (5 marks)

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

- a) List the radiographic signs of a tooth root abscess of the last maxillary cheek tooth (molar 3, Triadan 11s) in a five-year-old horse. (8 marks)
- b) Name the radiographic projection that will provide the best evaluation of the tooth roots of the **left** maxillary dental arcade. (2 marks)

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

- a) Describe the sonographic appearance of normal lung. (4 marks)
- b) Describe the sonographic signs of pleuropneumonia in the adult horse. (6 marks)

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

- a) List the sonographic signs of acute superficial digital flexor tendonitis. (4 marks)
- b) Describe the criteria by which tendon injuries are graded. (6 marks)

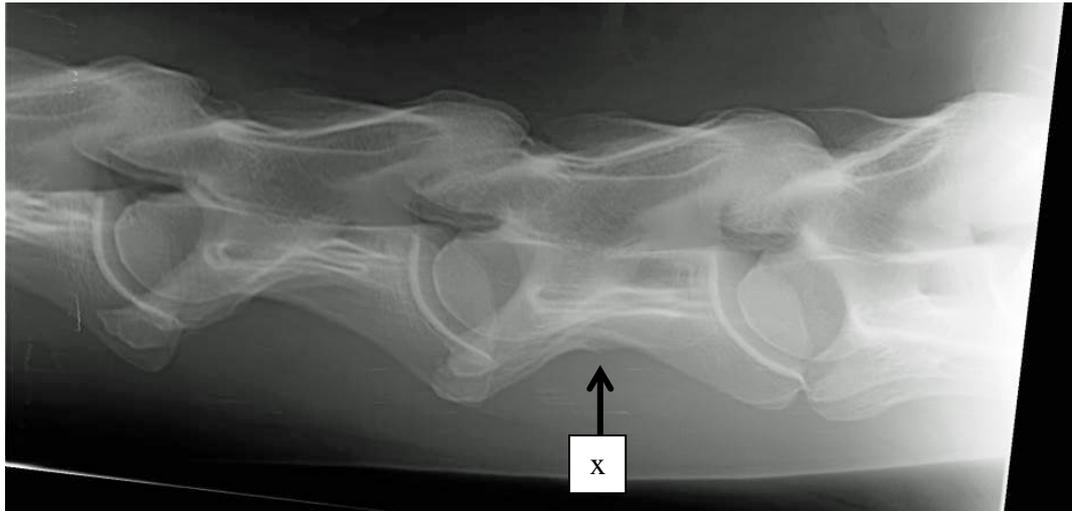
Please complete Section C in provided answer booklet

Paper 2: Veterinary Radiology (Large Animal)

SECTION C

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1. On the radiograph provided above the cervical vertebra labelled (x) is: (2 marks)
 - a. C4
 - b. C5
 - c. C6
 - d. C7

2. Which surface of the equine carpus will be projected in an unobstructed manner ('free projected') in a dorsolateral-palmaromedial radiograph? (2 marks)
 - a. Dorsomedial
 - b. Dorsolateral
 - c. Lateral
 - d. Dorsal

End of paper