NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2021

# EQUINE STUDIES

Time: 3 hours 200 marks

---

**PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY**

1. This question paper consists of 12 pages. Please check that your question paper is complete.
2. Read the questions carefully.
3. Answer **all** the questions.
4. All answers must be written in the Answer Book provided.
5. Please number your answers exactly as the questions are numbered.
6. It is recommended that you spend approximately one hour on each section.
7. It is in your own interest to write legibly and to present your work neatly.

---

## SECTION A

## QUESTION 1

1.1 Match the correct condition in Column B with the description in column A. Write only the number and the correct letter in the Answer Book, e.g., 8A.

| Column A | Column B |
|---|---|
| 1. Caused by damage to the suprascapular nerve. | A Parrot mouth |
| 2. Can be caused by recurrent uveitis. | B Poll evil |
| 3. An overshot maxilla, also known as brachygnathism, often seen in miniature breeds. | C Fistulous withers |
| 4. Striking its head against poorly designed or low-clearance structures, or improper use of equipment. | D Blindness |
| 5. Most common cause is mating a mare and stallion that have jaws of markedly different shapes. | E Sweeney shoulder |
| 6. Caused by damage to or breakdown of the laryngeal nerve. | F Roaring |
| 7. Caused by trauma and/or badly fitting saddle. | G Monkey mouth |

(7)

1.2 Describe the following terms:

1.2.1 Bursa (2)

1.2.2 Bile (2)

1.2.3 Breakover (2)

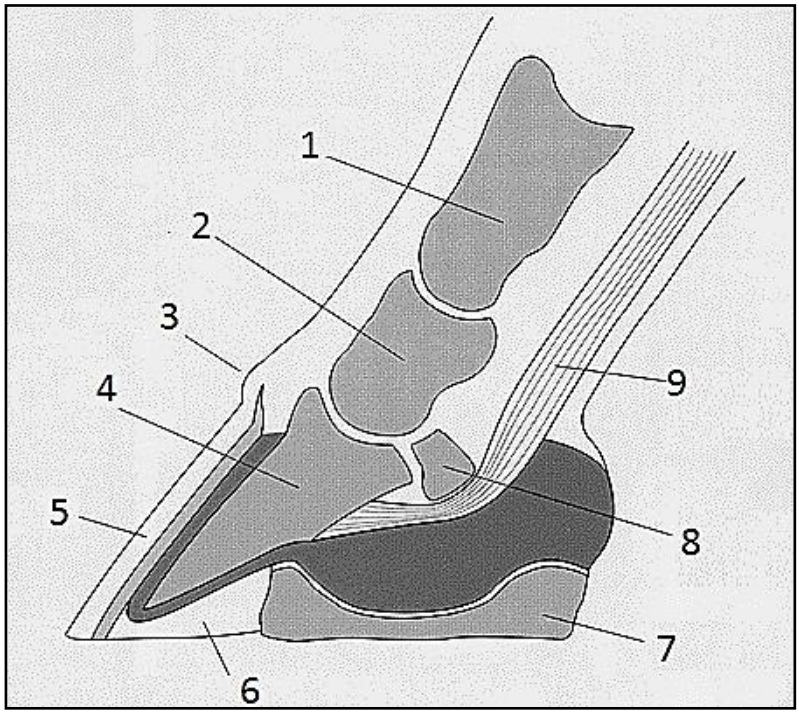
1.2.4 Urticaria (2)

1.2.5 A disease vector (2)

1.3 Provide labels for the parts numbered 1–9 in the diagram below.

Write the numbers under one another in your Answer Book and the correct label next to each number.

**Diagram of the equine foot**




[Source: <https://www.proprofs.com/quiz-school/story.php?title=ahs-202l-some-horse-questions>]

(9)

1.4 Define the following terms and give TWO examples of each in horses.

1.4.1 An infectious disease (4)

1.4.2 A contagious disease (4)

1.5 Give the full name for the following abbreviations of diseases.

1.5.1 EEV (1)

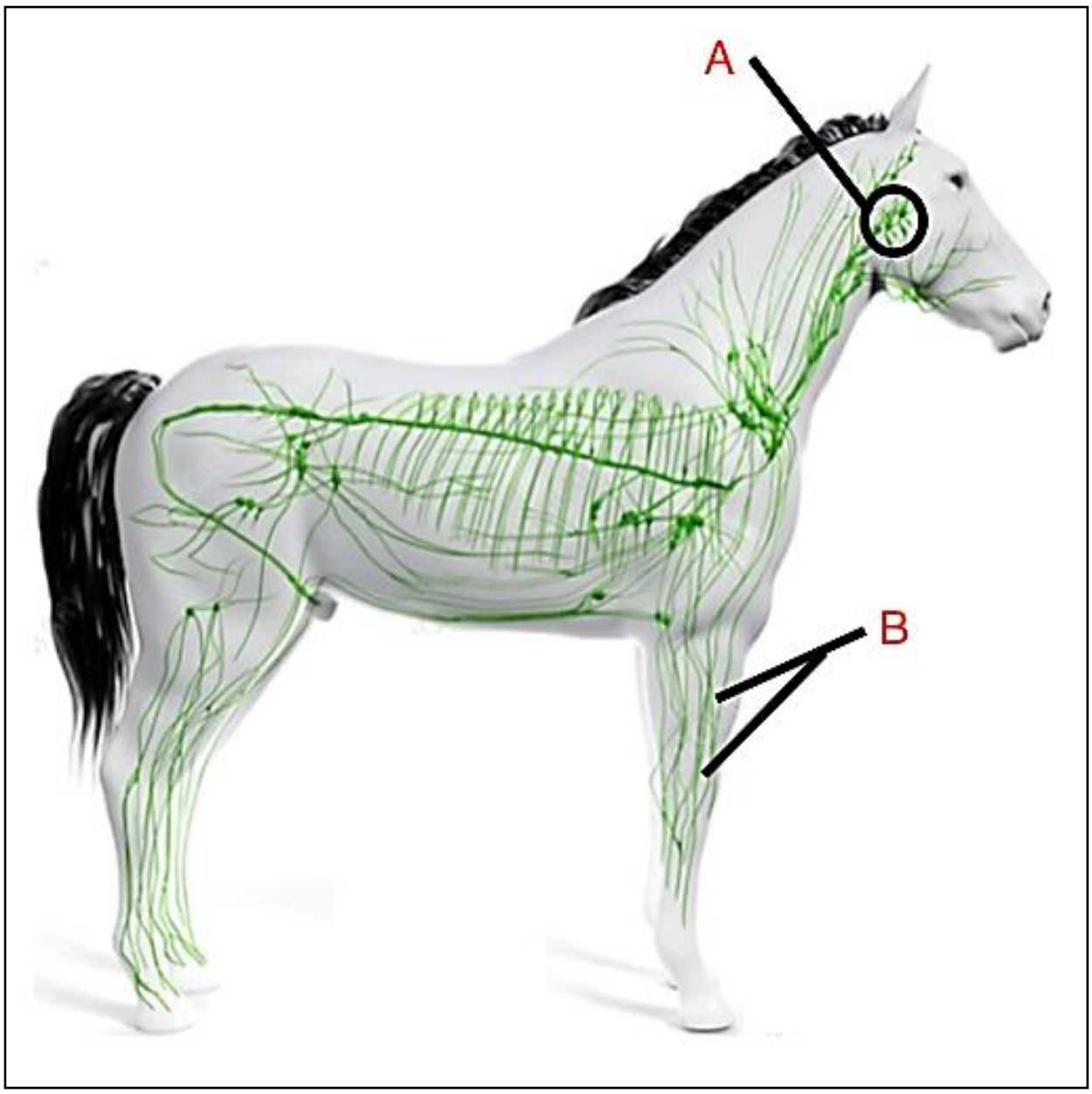
1.5.2 EHV (1)

1.5.3 EGUS (1)

**[37]**

## QUESTION 2

2.1 Study the diagram below and answer the questions that follow.




[Adapted from: <https://media.sciencephoto.com/f0/29/12/05/f0291205-800px-wm.jpg>]

2.1.1 Provide a heading for the diagram. (2)

2.1.2 Write down labels for A and B. (2)

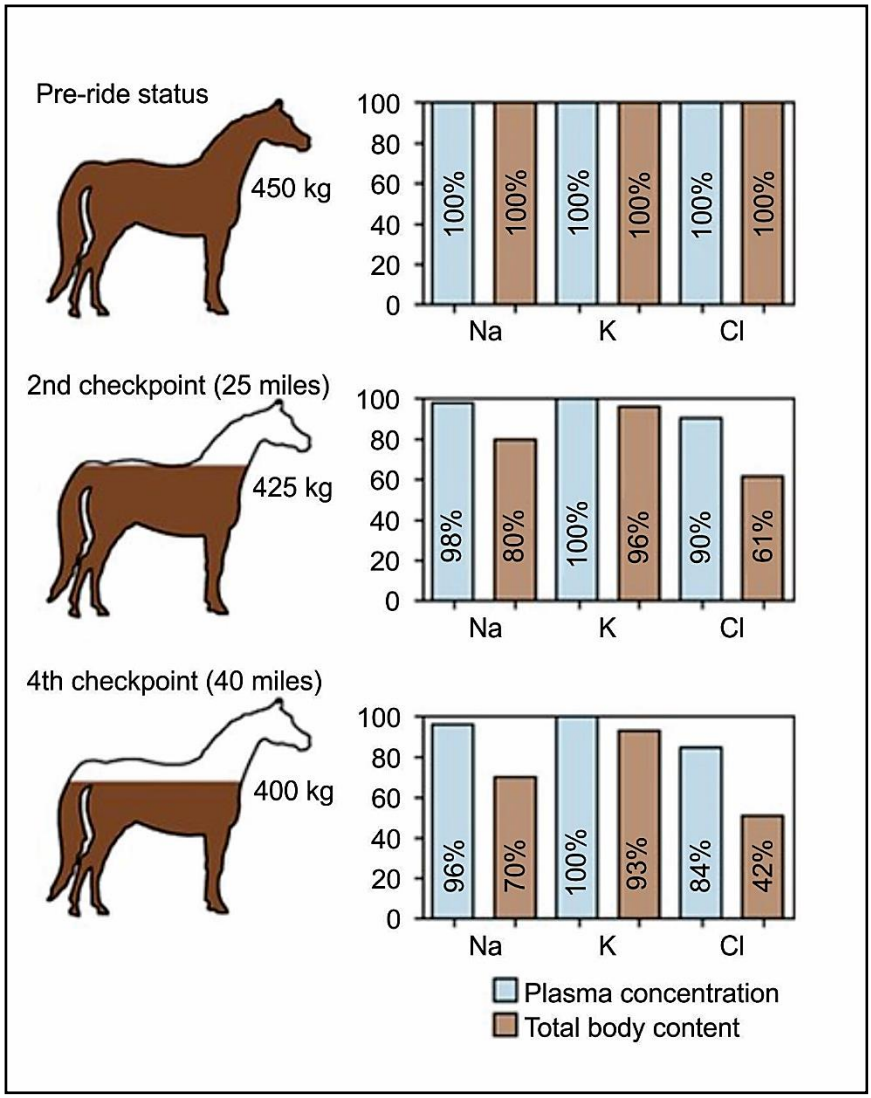
2.1.3 Name three unique features of the system shown in the diagram. (3)

2.1.4 Name the organ that contains approximately 30 litres of blood when the horse is at rest. (1)

2.1.5 Define the term *oedema*. (1)

2.2 Study the chart below and answer the questions that follow.

**Changes in plasma volume and total body water with steady-state exercise at 25 and 40 miles of endurance ride**




[Adapted from: Schott H. C., Hinchcliff K. W. 'Fluids, electrolytes, and bicarbonate', *Vet Clin North Am: Equine Pract*, 9(3):577–604, 1993.]

2.2.1 Provide an interpretation of the chart above. (5)

2.2.2 Which mineral suffered the greatest loss during this endurance ride? (1)

2.2.3 Name three minerals that are found in large quantities in electrolytes. (3)

2.2.4 Describe three causes and three symptoms of dehydration in an endurance competition. (6)

**[24]**

**61 marks**

## SECTION B

## QUESTION 3

Study the advertisement below and answer the questions that follow.


[Source: <www.vitafloor.com>]

3.1 Why would an increase in testosterone be important to breeders? (2)

3.2 As a breeder, what would make you trust this product? (2)

3.3 Give three ways to increase hoof growth besides using the Vitafloor. (3)

3.4 What behaviour in your horse would indicate to you that it is comfortable on the Vitafloor? (5)

3.5 Explain how the Vitafloor could shorten rehabilitation time. (3)

3.6 Give the acceptable time frame for the healing of a:

3.6.1 tendon. (1)

3.6.2 ligament. (1)

3.6.3 bone. (1)

3.7 What are the symptoms of laminitis? (6)

3.8 Complete the following table that compares the three main types of muscle fibre in horses. Write only the number and the correct information next to it in your Answer Book.

| | Type 1 Slow-twitch muscle fibres | 3.8.1 | 3.8.2 |
|---|---|---|---|
| Speed of contraction | 3.8.3 | Fast | 3.8.4 |
| Maximum tension developed | 3.8.5 | 3.8.6 | Low levels of tension |
| Oxidative capacity | High | 3.8.7 | 3.8.8 |
| Fatiguability | 3.8.9 | 3.8.10 | High |

(10)

3.9 What are the functions of cortisol? (2)

**[36]**

## QUESTION 4

Use the source below to answer Questions 4.1–4.5.

> If you're thinking of buying a vehicle for transporting your horse, it's important you get one that is capable of towing your trailer and its load. If you don't, you are not only putting you and your horse at risk – as well as other road users – you are breaking the law. This means if you do have an accident, your insurance won't be valid. Working out what your car can tow can be very confusing.'

[Adapted from: <https://horseandcountry.tv/towing-horse-safely-legally/>]

4.1 What vehicle and horse trailer checks should you do before transporting a horse? (4)

4.2 What driver's licence code is required to be able to tow legally in South Africa? (2)

4.3 4.3.1 'When transporting horses across long distances there is a possibility that the horse's lungs might be damaged.'

Name the condition that is referred to in this statement. (1)

4.3.2 Describe the condition RAD. (6)

4.3.3 Formulate a plan to avoid an acute episode of RAD whilst travelling with a horse that suffers from this condition. (3)

4.4 On which side of a two-berth horse trailer would you load a single horse and why? (2)

4.5 Study the licence disc of the towing vehicle (Figure 1) and that of the accompanying horse trailer (Figure 2) below. Use them to answer the questions that follow.


**FIGURE 1**

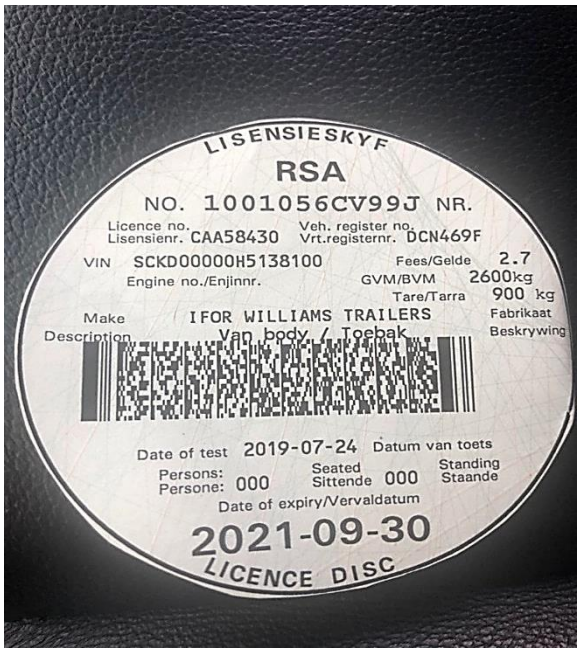



**FIGURE 2**

4.5.1 Explain why it would be illegal for this vehicle to tow this trailer. (3)

4.5.2 What can be done to make this combination of vehicle and horse trailer legal? (2)

4.6 When introducing new horses to a yard, you run the risk of introducing diseases into your healthy herd.

Explain the daily protocol you have in place for preventing the spread of disease. (6)

4.7 List seven types of records that you would routinely keep in order to run your yard effectively. (7)

**[36]**

## QUESTION 5

Study the table below and answer the questions that follow.

| Age | Body weight (kg) | Calcium (g) | Phosphorus (g) | Limestone (g/day) | Dicalcium phosphate (g/day) |
|---|---|---|---|---|---|
| 3 months | 100 | 37 | 31 | 104 | 148 |
| 6 months | 200 | 33 | 27 | 92 | 108 |
| 12 months | 300 | 31 | 25 | 87 | 92 |
| 18 months | 375 | 28 | 23 | 78 | 72 |
| Mature | 450 | 23 | 18 | 64 | 60 |
| Lactating | 500 | 33 | 23 | 92 | 108 |

[Source: Pillner S; 2006; *Horse Nutrition and Feeding*; 2nd Edition; p. 38]

5.1 At what age/stage of a horse's life does it require the most calcium, and why? (3)

5.2 Where in the horse's digestive process is calcium absorbed? (1)

5.3 Which supplements/foodstuffs can be added to a horse's diet to help balance the ratio of calcium to phosphorus (Ca:P)? (3)

5.4 Name five symptoms that a horse suffering from an inverted Ca:P ratio would show. (5)

5.5 What does the term *hypocalcaemia* mean? (2)

5.6 Large amounts of calcium can be lost in sweat. What other minerals are lost in sweat? (3)

5.7 5.7.1 Name one medical condition requiring a veterinary surgeon's attention that can occur when horses are exercised in excess of their fitness level and nutrient intake. (1)

5.7.2 Describe the condition you have named in Question 5.7.1 in detail. (10)

5.8 Design an ideal feed plan for a 4-year-old thoroughbred mare, weighing 400 kg, that is in medium work and suffering from the condition named in Question 5.7.1. (10)
**[38]**

**110 marks**

## SECTION C

Read the following source carefully and use it to answer the questions that follow.

**The Occurrence of Warmblood Fragile Foal Syndrome (WFFS) in Brazil**

WFFS, a genetic disease in horses, causes poor skin quality, mouth lesions, and joint issues – if the foals survive at all. It is a worldwide problem, not limited to Europe and North America, where cases have been reported so far. It occurs as frequently in warmbloods in Brazil as it does in Germany and the United States, according to a new study. Breeders and vets might need to consider this genetic disorder in breeding programs with mares that have increased pregnancy losses.

Scientists haven't yet identified any clinical cases in South America's largest country, but that does not mean its warmblood population does not carry the disorder. Brazilian warmbloods show WFFS at a frequency rate of nearly 6%, says Alexandre Secorun Borges, PhD, of the São Paulo State University School of Veterinary Medicine and Animal Science, in Botucatu, Brazil.

'Given this frequency, which is similar to what was seen and described in European and North American studies, we recommend increased discussions to increase knowledge about this disease among South American breeders and veterinarians,' he said. 'Further to those discussions, breed associations could decide on ideal control measures, possibly adopting testing procedures already in use by some European associations.'

**Basics of Inheritance**

It is possible for a mare and stallion to appear normal but carry the disorder. Carriers will only have one copy of the faulty gene. Embryos are affected when they receive copies of the WFFS gene from **both** parents, so it is important to ensure breeders do not cross a WFFS carrier stallion with a WFFS carrier mare.

'Despite a current worldwide frequency of about 5% in the Warmblood gene pool, there have actually been very few reported or described cases of the syndrome in North America and Europe and none here in Brazil,' Borges said. 'This reinforces the theory that affected foals are frequently not born at term. Early embryonic loss may occur at some point during gestation, and very rarely do breeders see an affected foal born live.'

**The Study**

In their study, Borges and his fellow researchers randomly selected 374 warmbloods on seven farms in Brazil for genetic sampling from mane and tail roots. The study population included 294 crossbred Brazilian sport horses, 47 Holsteiners, 12 Westfalens, eight KWPN horses, four Selle Français, three Belgian sport horses, two Hanoverians, two Argentine warmblood horses, one Württemberger, and one Oldenburg. They found a frequency of 5.5% for a faulty gene, the same as that reported by American researchers in 2011 and slightly higher than that reported by German researchers in 2013. What's more, they noted that the faulty gene was present on five of the seven farms—meaning it's not limited to single breeding programs.

However, they found no adults affected by the disorder —presumably, he said, because affected foals would have died before birth. 'Since in our study all animals were apparently healthy, and no clinical signs of WFFS were observed in animals during the sampling procedures, no animal was found to have WFFS.'

The incidence of a faulty gene shouldn't stop people from breeding animals carrying the gene, he explained. It just means breeders should be careful about the combinations they're choosing.

'Stallions that are carriers can still be used for breeding, as they still have many contributions to the breed,' he said. 'But it's not recommended to bring two carriers together, because that gives a chance of a foal with WFFS and probably increases early embryonic loss rates.'

[Adapted from:<https://thehorse.com/180175/warmblood-fragile-foal-syndrome-gene-occurrence-in-brazil/>]

## QUESTION 6

6.1 Why might there be no reported cases of the WFFS syndrome in Brazil? (1)

6.2 What type of horse is a *warmblood*? (2)

6.3 Discuss some of the possible consequences of the *popular sire* phenomenon. (3)

6.4 What is meant by a *genetic disease*? (2)

6.5 Suggest an ideal control measure that breeders could use for WFFS and justify your suggestion. (3)

6.6 List four considerations that should be made when choosing an appropriate stallion for a mare. (4)

6.7 Once a mare has foaled, there is always the risk of *failure of passive transfer*. Explain FPT. (5)

6.8 Give four signs of a healthy new-born foal. (4)

6.9 6.9.1 What condition in new-born foals is treated with the *Madigan squeeze technique*? (1)

6.9.2 Give a brief description of this procedure. (4)

**29 marks**

**Total: 200 marks**