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TOTAL
MARKS

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NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2024

EQUINE STUDIES

EXAMINATION NUMBER

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Time: 3 hours

200 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 31 pages. Please check that your question paper is complete.
2. Read the questions carefully.
3. Answer **all** the questions.
4. **Answer all the questions ON this question paper and hand it in at the end of the examination. Remember to write your examination number in the blocks above.**
5. It is recommended that you spend approximately one hour on each section.
6. It is in your own interest to write legibly and to present your work neatly.
7. ONE blank page (page 31) is included at the end of the paper. If you run out of space for an answer, use this page. Clearly indicate the number of your answer should you use this extra space.

FOR MARKERS' USE ONLY

Question	1	2	3	4	5	6	Total
Marks	29	38	39	39	25	30	200
Marked							
Moderated							

SECTION A**QUESTION 1**

1.1 Match the correct number in Column A with the appropriate letter in Column B.

	COLUMN A		COLUMN B
1.1.1	Failure of passive transfer	A	Prolonged retention of foetal membranes after foaling.
1.1.2	Dummy foal	B	Infection in the joints of a foal, leading to lameness.
1.1.3	Retained placenta	C	Incomplete transfer of antibodies from mare to foal.
1.1.4	Joint ill	D	Difficulty in standing and suckling shortly after birth.

1.1.1 _____

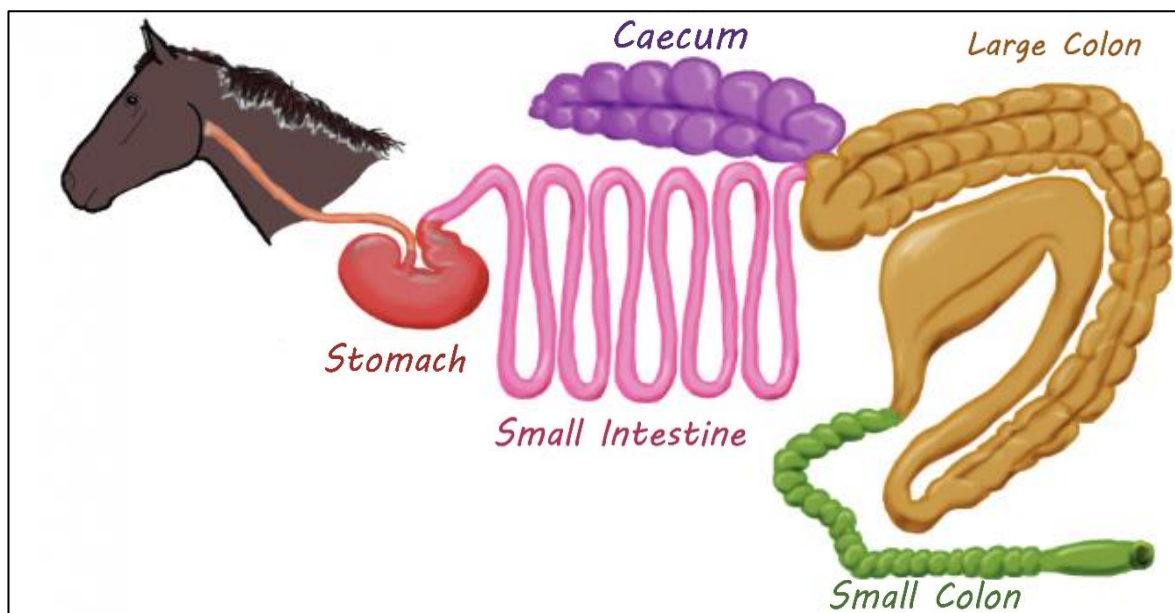
1.1.2 _____

1.1.3 _____

1.1.4 _____

(4)

- 1.2 Examine the diagram of the horse's digestive system, depicting the stomach, small intestine, and large intestine (Caecum, Large Colon and Small Colon).



[Source: <<https://nwdistrict.ifas.ufl.edu/phag/2018/09/21/understanding-a-horses-digestive-system/>>]

Identify the specific digestive processes occurring in each region.

1.2.1 Stomach _____ (2)

1.2.2 Small Intestine _____ (2)

1.2.3 Large Intestine _____ (2)

- 1.3 Define the terms below and provide one example specific to the pancreas for each.

1.3.1 Endocrine

(3)

1.3.2 Exocrine

(3)

1.4 Give the full name for the following disease abbreviations:

1.4.1 AHS _____ (2)

1.4.2 WNV _____ (2)

1.4.3 EHV _____ (2)

1.5 Identify the following Boney and Bursal Enlargements and write your answer in the third column.

1.5.1		
	[Source: < https://www.theirishfield.ie/bloodstock/horse-management/hands-on-win >]	
1.5.2		
	[Source: < https://www.theirishfield.ie/bloodstock/horse-management/hands-on >]	

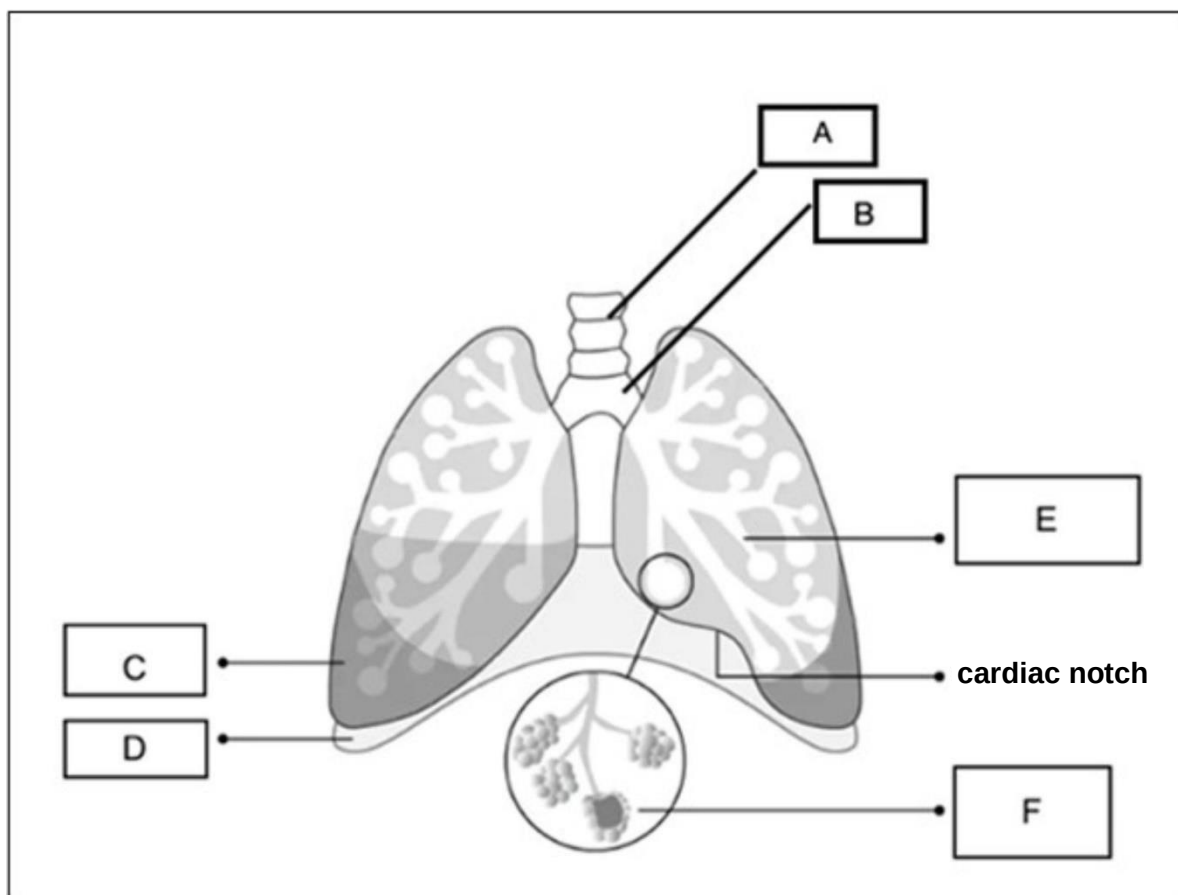
1.5.3		
	[Source: < https://horselifeandlove.blogspot.com/2016/04 >]	
1.5.4		
	[Source: < https://horselifeandlove.blogspot.com/2016/02/all-about >]	
1.5.5		
	[Source: < www.facebook.com/FoxRunEquineCenter/posts >]	

1.5.6		
	[Source: < https://horselifeandlove.blogspot.com/2016/03/all-about/ >]	
1.5.7		
	[Source: < https://en.wikivet.net/Equine_Orthopaedics_and_Rheumatology_Q%26A_17 >]	

(7)
[29]

QUESTION 2

- 2.1 Refer to the provided incomplete diagram below and provide labels for A to F in the space provided.



[Source: <<https://cancer.ca/en/cancer-information/cancer-types>>]

- A: _____
- B: _____
- C: _____
- D: _____
- E: _____
- F: _____

(6)

- 2.1.1 Provide a heading for the diagram.

(2)

2.1.2 Additionally, briefly give the functions of each labelled part below.

D: _____

(2)

E: _____

(2)

F: _____

(2)

2.1.3 When purchasing a horse, a vet will often be consulted to check for soundness. Discuss two different forms of unsoundness and how it can impact the performance of the horse.

(6)

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- 2.2 Draw and label a diagram of the Alveoli and use arrows to explain the exchange of gases at this site.



Note: 2 marks will be awarded for the scale and accuracy of your diagram. (12)

2.2.1 Identify the following condition and give the symptoms, treatments and causes of the condition.



[Source: <<https://www.phdveterinaryservices.com/post>>]

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

(6)
[38]

67 marks

SECTION B**QUESTION 3**

3.1 Study the image below and answer the questions that follow.

Date Day	Date Month	Date Year	Vaccine Name and Batch Number	Signature, Status and Stamp of Veterinarian
02	03	2016	 EQUILIS PREQUENZA TE A082B02	Dr PN Lubbe • BVSc Cert AVP Equipride (Pty) Ltd Bethlehem Cell: 073 676 1778
06	09	2016	Equilis• PREQUENZA Te Lot / Lote: A222B02 Mfg date / Prod: 01-2016 Exp / Exp: 01-2019	Dr PG Burger Klerksdorp 083 463 1911
14	06	2017	ProteqFlu™ Lot: L435899 23/07-2018 Exp.	DR KLERKSDORP DIERE HOSPITAAL 123 KLERKSDORP 2070
25	07	2018	ProteqFlu™ Lot: L435899 23/07-2018 Exp.	BOTHAVILLE DIEREKLINIEK BK Lingen Str 056 516 3261
17	04	19	ProteqFlu™-Te 1 Dose D.O.M.: 28/09-2019 EXP: 28/09-2019	Dr Pieter Burger Posbus 410 Box 6485 Flamwood 2575 Tel: 083 463 1911 Vat Reg: 4530736530
09	12	19	ProteqFlu™-Te 1 Dose Lot: L464860 05/04-2020 29/09-2018	DR LAUREN BREWIS CAPE VET CONSULTING 021 712 2290
01	06	20	Equilis• PREQUENZA Batch: A123A01 Exp: 04-2021	DR LAUREN BREWIS CAPE VET CONSULTING 021 712 2290
30	11	20	Equilis• PREQUENZA TE Batch: A272A01 Exp: 04-2023	DR LAUREN BREWIS CAPE VET CONSULTING 021 712 2290
07	06	21	Equilis• PREQUENZA Batch: A133A01 Exp: 05-2023	DR LAUREN BREWIS CAPE VET CONSULTING 021 712 2290
29	11	21	Equilis• PREQUENZA TE Batch: A274A01 Exp: 06-2023	DR LEE BARAGWANATH Cape Veterinary Practice 021 7122290
25	05	22	Equilis• PREQUENZA TE Batch: A283A01 Exp: 01-2024	Dr N. Le Roux (BVSc) DIEREKLINIEK Dierehospitaal/Animal Hospital
14	11	22	 EQUILIS PREQUENZA TE A288A01	Dr N. Le Roux (BVSc) DIEREKLINIEK Dierehospitaal/Animal Hospital

[Source: Photo courtesy of S. Copley: RSA, horse passport vaccination schedule pg 10]

3.1.1 Name the vaccinations that are being recorded in the image above.

(2)

3.1.2 How often should a competing horse receive these vaccinations?

(2)

3.1.3 Provide a simple overview of how vaccinations work to protect horses.

(4)

3.1.4 Would this horse be allowed to compete in 2022 based on the evidence in the photo above? Justify your answer.

(3)

3.1.5 A horse receives a vaccination for this disease on 21 June, from what date will the horse be able to compete and why?

(2)

3.2 Study the advertisement and answer the questions that follow.



EasiSport®

GRAIN FREE + LOW SUGAR

The Safe Feed For Horses with Laminitis Ulcers, Tying Up or Hyperactivity

FORM: Grain Free Pellets 	POWER LEVEL: 
--	--

FOR: Suitable for All Horses	
---	---

NUTRIENT INFO	NEAREST STOCKISTS	
-----------------------------	---------------------------------	--

Vitamins & Minerals for Complete Nutrition



Omega 3 & 6 for Brilliant Coat Shine



Cool Energy for Calm Behaviour



<8% Starch & Sugars so SAFE for Laminitis & Tying Up



TYPE:

Supplement Balancer Concentrate Full Feed



PACK SIZES:

20 Kg Bag

[Source: <<https://www.prydes.com.au/easisport>>]

3.2.1 Suggest why this food is safe for Laminitis, Ulcers and Tying up.

(3)

3.2.2 Name three types of feed you would NOT expect to find in the ingredients list.

(3)

3.2.3 Explain why this product has been labelled as a 'Complete Nutrition' or 'Full Feed'.

(2)

3.2.4 If a 500 kg horse receives a daily ration with a roughage to concentrate ratio of 60:40 at 2,5% of his body weight, calculate how many days a bag would last for this horse.

(6)

- 3.3 Design a feeding plan for Mirage, a 9-year-old Arabian mare competing in strenuous endurance competitions in a desert climate.

Consider her current Henneke Body Condition Score of 4 and a weight of 400 kg.

Your plan should include details on protein percentage, roughage and concentrate ratio, supplementation, energy sources, types of roughage, and any other pertinent factors you deem necessary.

[illegible]

(12)
[39]

QUESTION 4

- 4.1 Explain the significance of regular dental check-ups in preventing episodes of choke in horses.

(4)

- 4.2 Discuss the potential long-term consequences for a horse's health and well-being resulting from recurrent episodes of choke.

(4)

- 4.3 Construct an analysis table for choke occurrences in horses outlining the anatomy, causation, symptomatology, and immediate action of the caretaker.

Aspect	Horse Choke
Anatomy Affected	1.
Causes	1. 2. 3. 4.
Symptoms	1. 2. 3. 4. 5.
Action of the caretaker	1. 2. 3.

(13)

4.4 Create a management plan aimed at minimising the likelihood of future choke incidents in a horse experiencing recurrent episodes.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

(8)

4.5 Develop a comprehensive strategy for raising awareness about equine choke through a media campaign. Your strategy should include identifying key messages, target audiences, and creative content ideas. Additionally, justify your choice of media platforms.

[illegible]

QUESTION 5

Study the advertisement below and answer the questions that follow.

[Source: <<https://www.facebook.com/plusvitalireland/photos/a.756364101098242/3143896039011691/?type=3>>]

- 5.1 As seen in the advert, Plusvital Effivet can be used against three different pathogens. Name a skin condition caused by each of these pathogens that this product could be used for.

(3)

- 5.2 Evaluate whether this product's advertisement reflects an advancement in equine wound care.

(2)

5.3 Rank the severity of the following skin conditions: mud fever, sweet itch, urticaria, melanomas, and warts based on their impact on equine welfare and performance. Justify your ranking order.

[illegible]

5.4 Discuss the challenges that vets might face associated with diagnosing and managing equine urticaria.

[illegible]

(3)

5.5 Recommend an isolation protocol for young yearlings with papilloma and equine influenza at a stud farm facing financial constraints. Taking into consideration welfare of horses and containment of disease. Justify your recommendation.

[illegible]

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(7)
[25]

103 marks

SECTION C**QUESTION 6**

Read the following case study and answer the questions that follow.

To Clone or Not to Clone?

Cloning horses is no longer the alien concept it once was. While still far from being commonplace, this technology has developed beyond recognition over the past two decades, with cloning and cloned bloodlines now more accessible than ever to British breeders, and playing an important role in genetic preservation.

A clone horse is a genetically identical replica of another horse, with no programmed changes to their DNA. The pair are genetic twins, but born at different times. Horses are typically cloned in order to preserve their valuable bloodlines, often in cases where a superior or highly valuable horse has died or been gelded and therefore is unable to produce offspring. The science is also increasingly being used for the genetic preservation of rare and endangered breeds.

Is cloning horses legal?

Yes, although the rules around it vary between equestrian industries and studbooks. While cloning is prohibited in the thoroughbred industry, since 2012 the FEI has allowed the participation of clones and their progenies in equestrian sport.

How does cloning actually work?

Cloning horses involves a tissue sample being taken from the horse and the DNA-containing nucleus of a cell transferred into a recipient egg, or oocyte, which has had the DNA removed.

This egg is then implanted into a recipient mare to be carried to term. The first step in the cloning process is preserving the cells, which costs R11 500 + VAT via British company Gemini Genetics, along with a storage fee of R280 per month until you are ready to proceed with the process. The next stage, in which the cells are cultured, costs around R27 600 with Gemini Genetics.

When it comes to the actual cloning procedure, the cost is much more. It varies per species, but expect to pay in the region of R1 615 000 to clone a horse with leading USA-based cloning company ViaGen.

Is it possible to clone a horse that has died?

Yes, but you have to move fast – time is of the essence in a post-mortem situation. Tissue samples must be taken by a vet after a horse has died and Gemini Genetics states that the maximum length of time it can accept the biopsy samples is five days post mortem, as long as the animal has been kept in optimal conditions during this time (approximately 4 degrees). The chances of successful preservation decreases with every day the horse has been deceased.

There are now several examples of top horses who have been cloned. The double Olympic silver medal-winning showjumper Gem Twist (Good Twist x Noble Jay) has two clones on the ground: Gemini CL, now 15, is currently standing in Europe and the sire of several progeny already out on the showjumping circuit, while 12-year-old Murka's Gem stands at Stallion AI Services in Shropshire.

The top Olympic eventing stallion Chilli Morning has three six-year-old clones on the ground, known as Deuce, Trey and Quattro and officially registered as Chilli Morning II, III and IV. Chilli Morning IV (Quattro) is in training with Gemma Stevens (née Tattersall), and has finished fourth and 11th in his first two BE100s, with a double clear on both occasions.

Gemma, who started all three clones, is now aiming Quattro at the 2023 young horse World Championships at Le Lion d'Angers. Chilli Morning III (Trey) went to Cheshire-based Chinese rider Alex Hua Tian and Deuce to German Olympic champion Julia Krajewski. Another of William Fox-Pitt's Olympic partners Tamarillo has also been cloned; Tomatillo was born in 2013, and is now eventing successfully at four-star level with Ireland's Aaron Millar. The famous Irish stallion Cruising has also been cloned; Cruising Arish and Cruising Encore were born in 2012. Both now stand at Hartwell Stud, with several offspring on the ground between them. Cruising Encore has jumped up to 1.40m with Irish rider Edward Doyle, while Arish has reached 1.30m level and is ridden by Ireland's Feaha Moore. A clone of Nick Skelton's prolific showjumping partner Arko III was also born in 2021, seven months following the death of Arko himself.

Do clones look exactly like the original horse?

Although clones are genetic replicas, they do not tend to look identical to the original horse. The most obvious difference is often a variation in markings. White markings are not driven by genetics, but due to random migration of white cells during foetal development. This means that the shape and positioning of white markings is likely to differ between the original horse and its clones. Horses' personalities are influenced by their environment as much as their genetics, meaning the personalities of clones can vary compared to that of the original horse. According to the team at ViaGen, though, clients always report that their clones remind them of the original animal's personality, even if they are not exactly alike.

Is it possible to clone a clone?

Yes it is possible – a clone is a normal animal, so the procedure is the same – and to date several clones have been produced from other clones, usually in cases where people wish to continue just one line.

[Source: <Adapted from: <<https://www.horseandhound.co.uk/features/cloning-horses-facts-736969>>]

6.1 Why do breeders often choose to clone horses?

(3)

6.2 Explain the process of cloning horses in simple terms.

(3)

6.3 Discuss the reasons why cloning is prohibited in the thoroughbred industry.

(2)

6.4 If you were a breeder, under what circumstances might you consider cloning a horse?

(2)

6.5 Compare the costs of cloning a horse with Gemini Genetics and ViaGen.

(4)

6.6 What challenges might arise in the cloning process if tissue samples are not taken promptly after a horse's death?

(2)

- 6.7 Do you agree with the use of cloning for preserving rare and endangered breeds? Justify your answer.

(6)

- 6.8 Assess the ethical implications of cloning horses for sport and breeding purposes.

(3)

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30 marks

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REMEMBER TO CLEARLY INDICATE AT THE QUESTION, THAT YOU USED THE ADDITIONAL SPACE, TO ENSURE THAT ALL THE ANSWERS ARE MARKED.

[illegible]