



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2018

EQUINE STUDIES

Time: 3 hours

200 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 14 pages and 3 sections. Please check that your question paper is complete.
 2. You are required to answer **all** the questions.
 3. All answers must be written in the Answer Book provided.
 4. Answers must be numbered exactly as the questions are numbered.
 5. Read the questions carefully.
 6. It is recommended that you spend approximately 1 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 Give the correct term for the description below:

1.1.1 The duct joining the ovary to the uterine horn.

1.1.2 A supplement that encourages good bacterial growth in the hindgut of the horse.

1.1.3 Tooth adapted for grinding.

1.1.4 Hormone secreted by the uterus, causing the corpus luteum to stop working so that a mare comes back into season.

1.1.5 Swollen leg caused by the lymphatic system becoming infected after a minor cut.

(5)

1.2 Give a definition for the following:

1.2.1 Virus

1.2.2 Epistaxis

1.2.3 Carbohydrate

1.2.4 Amino acid

1.2.5 Capillary vessel

(10)

1.3 State whether the following are true or false. If false, correct the statement to make the statement true.

1.3.1 Thrush produces cheesy white discharge from the frog Sulci.

1.3.2 White line disease is when a bacterial or fungal infection gets into the area between the hoof wall and sole of the foot.

1.3.3 Laminitis is known as founder when the pedal bone rotates and drops in the hoof capsule.

1.3.4 Navicular disease is a condition of the proximal sesamoid bones.





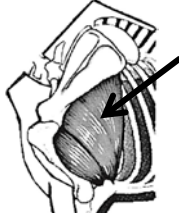
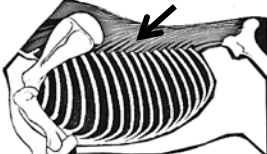
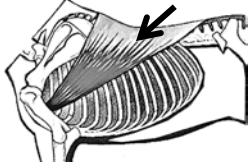
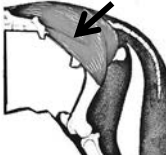
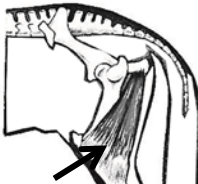
1.3.5 Sheared heels is when the two bulbs of the heel become narrow and closer together.

1.3.6 Side bone is usually seen in young, light-breed horses.

(12)
[27]

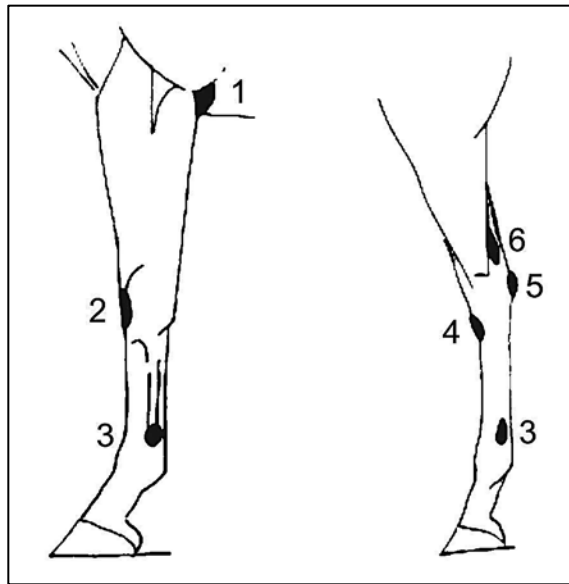
QUESTION 2

2.1 2.1.1 Match the picture of the muscle in column B to the muscle name in column A.

A	B	
1. Trapezius muscle		A
2. Latissimus dorsi muscle		B
3. Longissimus dorsi muscle		C
4. Splenius muscle		D
5. Triceps muscle		E
6. Gluteal muscle		F
7. Brachiocephalic muscle		G
		H
		I

(7)

- 2.1.2 Name two conditions of muscles that may be seen in the thoroughbred race horse. (2)
- 2.2 2.2.1 Name the ligament and two tendons that run down the back of the cannon bone. Write them in order from deep to superficial in anatomical position. (4)
- 2.2.2 Why, after a tendon injury, is stable rest first prescribed and then walking in hand? (4)
- 2.3 Name the bursal enlargements caused by stress and strain found at the anatomical areas indicated by numbers 1 to 6 in Figure 1.



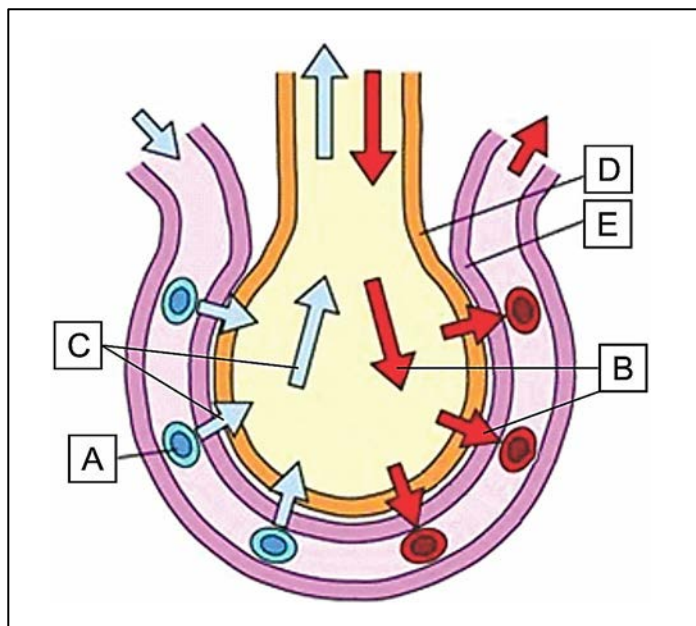
[Source: *The Athletic Horse*: Carol Foster, pg 116]

Figure 1

(6)
[23]

QUESTION 3

3.1 Study Figure 2 below and answer the questions that follow.



[Source: <<https://socratic.org>>]

Figure 2

- 3.1.1 Give a descriptive label of the biological process shown in Figure 2. (3)
- 3.1.2 Give the name of cell A. (1)
- 3.1.3 What gives cell A its red colour? (1)
- 3.1.4 Give one other function of this red pigment found in cell A. (1)
- 3.1.5 What gas is moving at B? (1)
- 3.1.6 What gas is moving at C? (1)
- 3.1.7 Explain what drives the movement of gases B and C as shown in the diagram. (2)
- 3.1.8 When a horse is exercising, the movement of gases across the membranes needs to increase. Give three ways in which this can happen. (6)
- 3.1.9 Name D. (1)
- 3.1.10 Name E. (1)
- 3.1.11 What about the anatomy of structures D and E is important to allow movement of gas to take place easily and quickly? (2)

[20]

70 marks

SECTION B**QUESTION 4**

- 4.1 Study Figure 3 below showing endocrine control of reproduction and answer the questions that follow.

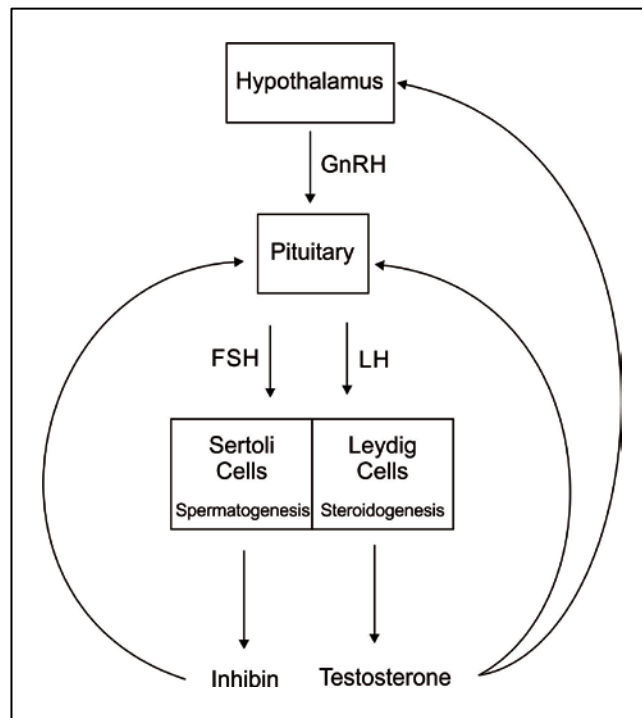


Figure 3 Endocrine control of reproduction.

- 4.1.1 Where would you find Sertoli and Leydig cells respectively? (2)
- 4.1.2 Besides having a positive feedback on the hypothalamus and pituitary gland, list 4 characteristics testosterone is responsible for. (4)
- 4.1.3 Give the full name of FSH. (1)
- 4.1.4 Name the functions of LH in the mare. (2)

4.2 Study Figure 4 below and answer the questions that follow.

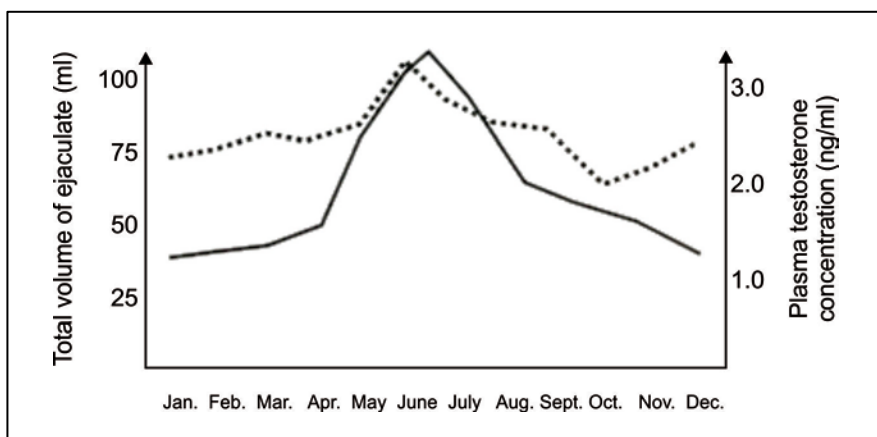



Figure 4 Schematic representation of plasma testosterone concentration (dotted line) and total volume of ejaculate, for stallions in the northern hemisphere, throughout the year.

- 4.2.1 Why is it important to state that this information is for the northern hemisphere? (2)
- 4.2.2 Why do testosterone levels reach a peak before the total sperm volume reaches its peak? (2)
- 4.2.3 During which months would you breed with these stallions? Justify your answer. (3)

[16]

QUESTION 5

Use the feed label in Figure 5 below to answer the questions that follow.



EQUUS

Cool 'n Perform 12

(Class: Concentrated Horse Feed for Full Grown Horses)
Reg No. V21364 Act 36 of 1947

A Balanced and All Natural Horse Conditioner with the needed goodness to keep all types of horses in peak condition while maintaining calmness.

40 kg

COMPOSITION					
Protein (min)	120	g/kg	120	Moisture (max)	
Fat (min)	50	g/kg	6,7	Calcium (min)	
Fibre (min)	100	g/kg	10	Calcium (max)	
Fibre (max)	140	g/kg	4,2	Phosphorus (min)	
Sodium (min)	4	mg/kg	3,3	Magnesium (min)	
		mg/kg	8	Potassium (min)	
Salt (min)	10	g/kg			
Digestible Energy (min)	12	MJ/kg			
Vitamin A (min)	8 000	IU/kg	1 000	Vitamin D ₃ (min)	
Vitamin E (min)	120 000	IU/kg			
Vitamin B ₁ (min)	10	mg/kg	9	Vitamin B ₆ (min)	
Folic Acid (min)	6	mg/kg			
Manganese (min)	55	mg/kg	25	Cal Pan (min)	
Copper (min)	35	mg/kg	1,1	Iodine (min)	
Selenium (min)	0,6	mg/kg	275	Iron (min)	
Zinc (min)	115	mg/kg	0,15	Cobalt (min)	

Ca:P Ratio 1,6:1 to 2,2:1

**High in Omega 3 containing oils ~ High in Anti-oxidants,
Vitamin E & Selenium ~ Free of Raw Maize**

BEST BEFORE DATE: 6 MONTHS FROM MANUFACTURE DATE

Figure 5

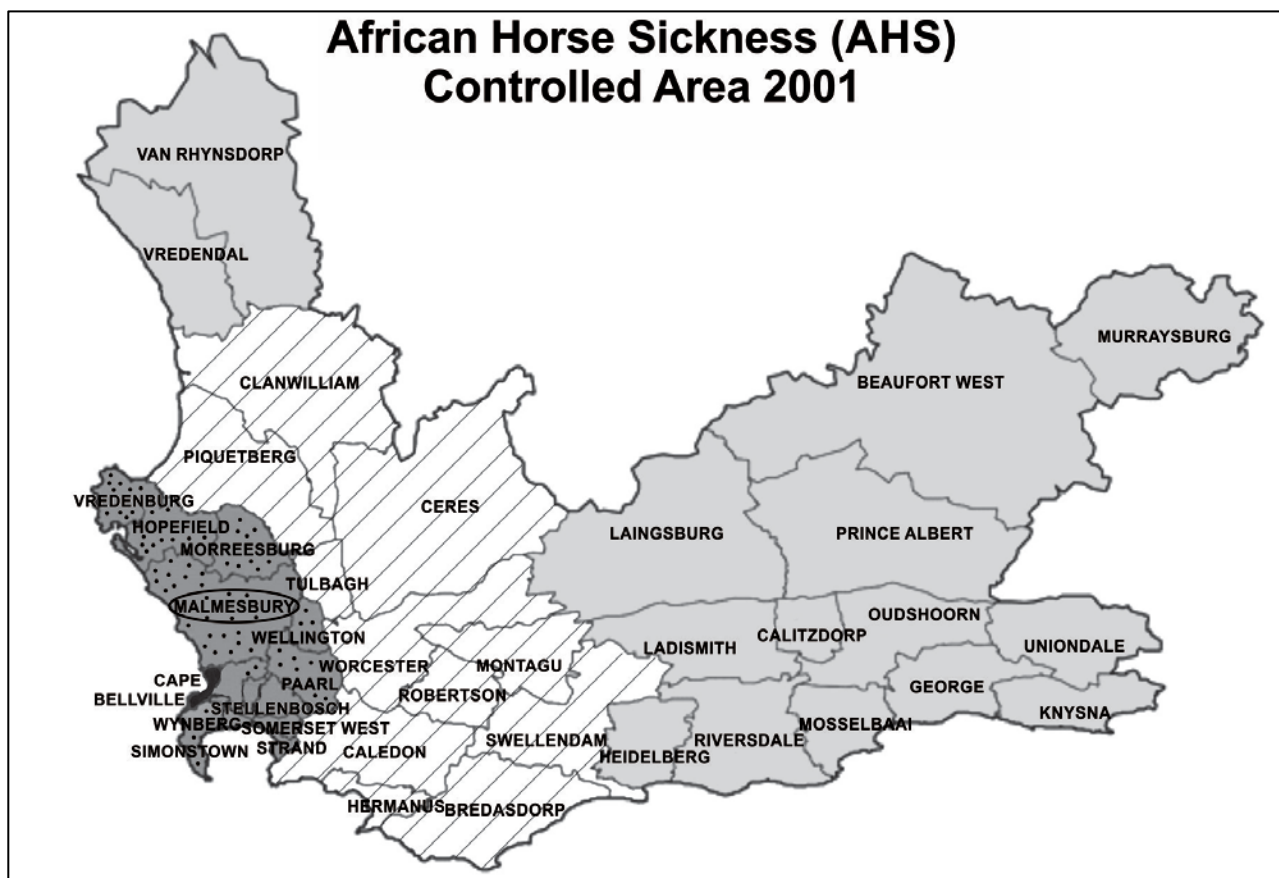
- 5.1 What does the 12 stand for in "Cool 'n Perform 12"? (1)
- 5.2 Do you think this feed is really suitable to "keep all types of horses in peak condition" as stated on the label? Explain your answer in terms of type, age, condition, and workload of the horse. (10)
- 5.3 If a horse was fed 2 kg of this feed twice a day, how much protein in grams would it be getting daily? (3)
- 5.4 If the Ca : P ratio was imbalanced and the phosphorus was too high,
- 5.4.1 how would you easily correct this ratio? (2)
- 5.4.2 what would happen if you left this imbalanced? (1)
- 5.5 Why is it important that the label states "free of raw maize"? (4)

- 5.6 How is micronised maize different to raw maize in its preparation, appearance and use by the horse? (3)
- 5.7 There is 50 g/kg of fat in this feed. Why is fat good in this type of feed? (3)
- 5.8 What are anti-oxidants useful for? (2)
- 5.9 Salt is included in this feed. Why is salt supplementation so important in horses? (3)
- 5.10 A horse on this feed needs box rest. How would you adjust its feeding? (2)
- 5.11 Why is it important that a horse on box rest still gets sufficient balanced nutrients? (2)
- 5.12 If a horse on this feed was in foal, how would you change this horse's diet? (5)
- 5.13 Your horse bolts its morning feed. Give three preventative measures you can take to eliminate this behaviour. (3)

[44]

QUESTION 6

Study the source in Figure 6 below and use it to answer the questions that follow.



[Source: <<http://www.africanhorsesickness.co.za>>]

Figure 6

- 6.1 What is African Horse Sickness (AHS)? (2)
- 6.2 Name the four zones currently in place as shown on the map. (4)
- 6.3 Must horses be vaccinated in all of these zones? Explain your answer. (4)
- 6.4 Why do we need such strict regulations within these zones? (3)
- 6.5 What are the new AHS vaccination requirements? (2)
- 6.6 Why were these new vaccination requirements made? (3)
- 6.7 If you had to truck horses from Durban to a show in Malmesbury, what requirements would you need in place to do this? (4)
- 6.8 If this trip is a 14-hour drive, explain how you would care for the horse on this trip (pre-travel, feed, water, stops, dress). (5)
- 6.9 If you were taking one horse in a two-berth box, on which side would you load the horse? Justify your answer with sound reasoning. (2)

- 6.10 You are worried about travel sickness. Give five signs or symptoms you would be looking for. (5)
- 6.11 Respiratory distress is often seen in AHS and other respiratory-related conditions. Describe what a horse in respiratory distress would look like. (3)
- 6.12 A horse with AHS often has fluid in the lungs. How would this affect gaseous exchange in the lungs? (3)
- [40]**

100 marks

SECTION C**QUESTION 7**

Read the information below and answer the questions that follow.

GASTRODISCUS AEGYPTIACUS

Gastrodiscus aegyptiacus is a **parasitic fluke** or parasitic worm belonging to the class of worms known as Trematodes.

Gastrodiscus aegyptiacus is a fluke species that has horses, swine and related wild animals (zebras, warthogs, etc.) as final hosts. It is found mainly in Africa as well as in India and other Asiatic countries. Little is known about the prevalence and incidence of these flukes. In a study in Egypt, it was found that 22% of 156 donkeys and 15% of 40 horses investigated shed eggs of this parasite.

These flukes do not affect cattle, sheep, goats, dogs or cats and there is no evidence that these flukes can infect humans.



Figure 7.1 Egg of fluke



Figure 7.2 Intermediate host – freshwater snail

Predilection sites of *Gastrodiscus aegyptiacus* are the small intestine, caecum and the colon.

Adult *Gastrodiscus aegyptiacus* are about 1,5 cm long and 0,5 cm–0,7 cm broad. They have the flat body and the oval shape typical for most flukes, but their body is divided in a small, conical anterior part and a wider posterior part with numerous papillae arranged in transverse rows.

As with other flukes, they have no external signs of segmentation. The mouth ends in the pharynx, a muscular tube that allows sucking. The digestive system is blind (i.e. without anus: the only opening is the mouth) and not linear, as in most animals, but branched, ending in several blind ducts (called *coeca*). Like most flukes, *Gastrodiscus* are simultaneous hermaphrodites, i.e. they have both male and female reproductive organs.

The **eggs** have an oval shape and are rather large (~110 micrometer × 180 micrometer), thin-shelled and have a brownish colour.

Gastrodiscus aegyptiacus has an indirect life cycle with freshwater snails as intermediate hosts, mainly of the genera *Bulinus* and *Cleopatra*.

Cont.

The eggs shed by adult flukes are expelled with faeces. Once outside the host, the larvae called **miracidia** hatch out of the eggs in a few days. These larvae can survive for weeks without a host provided there is enough humidity. They die quickly in a dry environment. Miracidia can swim and penetrate actively into the snails where they develop successively to **sporocysts**, **rediae** and **cercariae**, the usual larval stages of most fluke species.

Mature cercariae leave the snail, attach to the vegetation and produce **cysts**, the so-called **metacercariae**, which are infective for the final host. Horses become infected when grazing on contaminated pastures.

Once a final host ingests metacercariae while grazing, they migrate to their predilection sites.

Most infections with *Gastrodiscus aegyptiacus* are benign and show no clinical signs. But in case of heavy infestations severe health problems with diarrhoea, blood loss, swelling, weight loss, and poor condition can follow.

Diagnosis is done by detection of eggs or immature flukes in the faeces or by identification of the adult flukes after necropsy. A history of grazing in marshy pastures together with such clinical symptoms may suggest infection with *Gastrodiscus aegyptiacus*.

Most flukicides are approved only for ruminants (cattle, sheep, goats) and not for horses or swine, simply because they are seldom a problem for equine or porcine hosts. They may be used on horses or swine under the supervision of a veterinary doctor.

Neither Ivermectin, Moxidectin nor Levamisole, nor most other benzimidazoles are effective against *Gastrodiscus aegyptiacus*. There are so far **no vaccines** against *Gastrodiscus aegyptiacus*.

There are currently no reports on resistance of *Gastrodiscus aegyptiacus* to flukicides.



Figure 7.3 Horse with fluke infestation

[Sources: <<http://fourwaysequine.co.za>> and <<http://parasitipedia.net>>]

- 7.1 Accurately draw a fluke from the description on the previous page. (4)
- 7.2 Differentiate between the term anterior and posterior used to describe the fluke. (2)
- 7.3 Describe or draw the lifecycle of this fluke. Include the names of all the stages. You may add simple drawings to assist you. (10)
- 7.4 Give the scientific term for blood loss or low blood count referred to in the text. (1)
- 7.5 Explain, in your own words, how these worms are diagnosed. (2)
- 7.6 Humans cannot contract this fluke. What term is used to describe diseases that humans can contract from animals? (1)
- 7.7 The text states that there is no resistance to the flukicide. Give 3 reasons why a horse might not improve after being treated for this fluke. (3)
- 7.8 Give 5 ways you could prevent infestation of this fluke. (5)
- 7.9 There is resistance to dewormers in other equine worms. How are the horse community and vets trying to stop resistance? (2)

30 marks

Total: 200 marks