NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2016

EQUINE STUDIES

Time: 3 hours 200 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 10 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 Define the following terms:

1.1.1 Polyoestrous
1.1.2 Quidding
1.1.3 Colic
1.1.4 Haemoglobin
1.1.5 Abscess (5)

1.2 Give the name for the following descriptions:

1.2.1 The period between the estrus phase when the mare is not receptive to the stallion.
1.2.2 Teeth that are usually removed because they interfere with the bit.
1.2.3 When horses with Cushing's syndrome grow long, curly coats.
1.2.4 Muscle pigment that can hold oxygen.
1.2.5 The indentation above the horse's eye that usually swells with AHS. (5)

1.3 Correct the following FALSE statements to make them true.

1.3.1 A grey horse must always have two grey parents.
1.3.2 The gallop is a three-beat gait.
1.3.3 Diabetes type two is when the body does not respond to glucagon.
1.3.4 Cushing's syndrome is when there is a growth of the pineal gland.
1.3.5 The horse's temperature and pulse rate are 36.5–37.5 °C and 30–50 bpm respectively. (5)

1.4 Match Column A to the correct answer in Column B. Write just the number and correct letter.

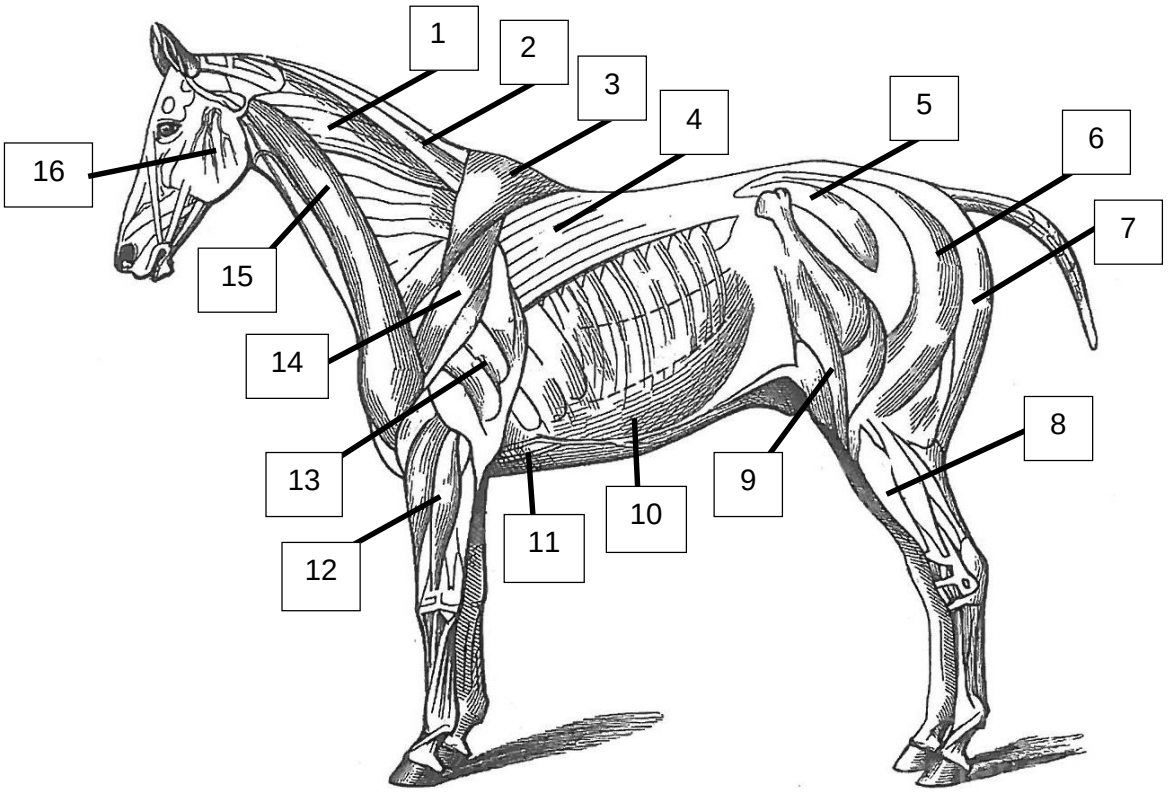
Column A	Column B
1.4.1 RAD was formerly known as	A. Round worm
1.4.2 Hormone responsible for retaining water in the body	B. ADH
1.4.3 Anatomical part affected by choke	C. COPD
1.4.4 Worm responsible for making the horse rub its tail	D. Seven
1.4.5 Number of thoracic vertebrae in the horse	E. Oesophagus
	F. Pin worm
	G. GnRH
	H. Trachea
	I. Eighteen

(5)
[20]

QUESTION 2

2.1 Give the number that corresponds to the following muscles:

2.1.1 Brachiocephalic muscle
2.1.2 Triceps muscle
2.1.3 Latissimus dorsi muscle
2.1.4 Splenius muscle
2.1.5 Biceps femoris muscle

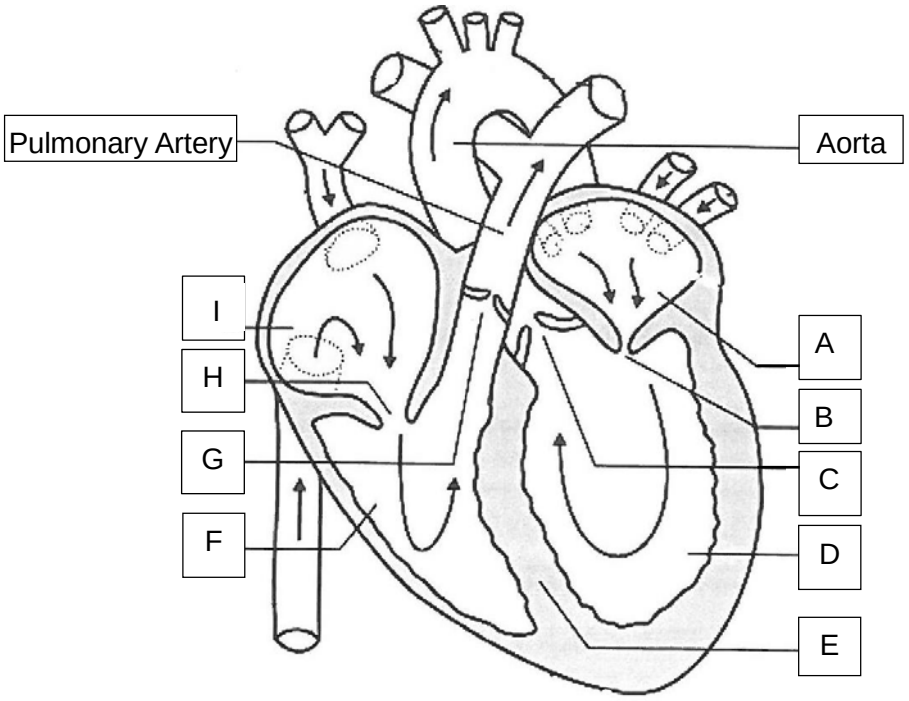


[Source: <http://fineartamerica.com/featured/horse-muscle-structure-granger.html>]

(10)

2.2 Give the functions of any four of the muscles listed in Question 2.1 (4)

2.3 Name the parts of the heart labelled A–I below.



[Source: <http://www.dummies.com/how-to/content/how-blood-flows-through-the-human-heart0.html>]

(9)

2.4 Draw and label a schematic representation of the entire digestive tract of the horse. (17)

[40]

60 marks

SECTION B

QUESTION 3

Read the following article and answer the questions that follow.

Hendra virus: protect horses to protect humans

By Katie Navarra

[Source: iStock]

The Hendra virus (HeV) is bad news. It's deadly for horses, deadly for humans, and can be passed from sick horse to human caregiver. As of now, Hendra has only been identified in Australia, and researchers there are working to find the best ways to prevent its spread.

The flying fox, a member of the bat family, is a native Australian species. This protected bat is an important pollinator species, but it carries a potentially deadly disease called the Hendra (HeV) virus. To date, no human has directly contracted the virus from contact with a flying fox, but people can (and have) become infected through direct exposure to infected horses' bodily fluids.

Although the exact route of transmission to horses has not been confirmed, researchers believe it to be from flying fox feces*, placental fluids, or other bodily fluids. "It is thought that horses grazing contaminated pasture or feeding from contaminated feed or water bins can contract the virus," said Sarah-Jane Wilson, BVSc, MVPHMgt, PhD, of the University of Sydney Faculty of Veterinary Science, in Camden, New South Wales, Australia.

The majority of horses that have contracted the disease have died, and the mortality rate in humans is 50%. "Complications of the disease in humans can include infections of the lungs or brain – severe cases have caused pneumonia and encephalitis," she said.

To reduce the spread of HeV from flying foxes to humans, Wilson recommends that owners have their horses vaccinated. The vaccination, an initial two-dose protocol followed by a yearly booster, is the preferred method of preventing infection in horses. "It protects the horses, therefore protecting the humans," Wilson added.

A regular vaccination schedule is also an economic solution. "The flying fox is a protected species in Queensland, so you can only destroy them or interfere with their habitats under a strict mitigation permit, which limits the methods for controlling them," she explained. Their habitats are widely dispersed throughout South East Queensland, often in areas where horses are housed or grazed.

[Source: <http://www.thehorse.com/articles/36989/hendra-virus-protect-horses-to-protect-humans> Accessed 16 January 2016]

* feces (faeces): dung or guano

3.1 Give the scientific word for diseases that can be passed from animal to human. (1)

3.2 What is the vector of the Hendra Virus? (1)

3.3 The Hendra Virus could spread to other places around the world. How would this be possible? (2)

3.4 Explain the term mortality rate. (2)

3.5 State two ways by which you could prevent the spread of the virus from horse to human caregiver. (2)

3.6 How do vaccinations work? (3)

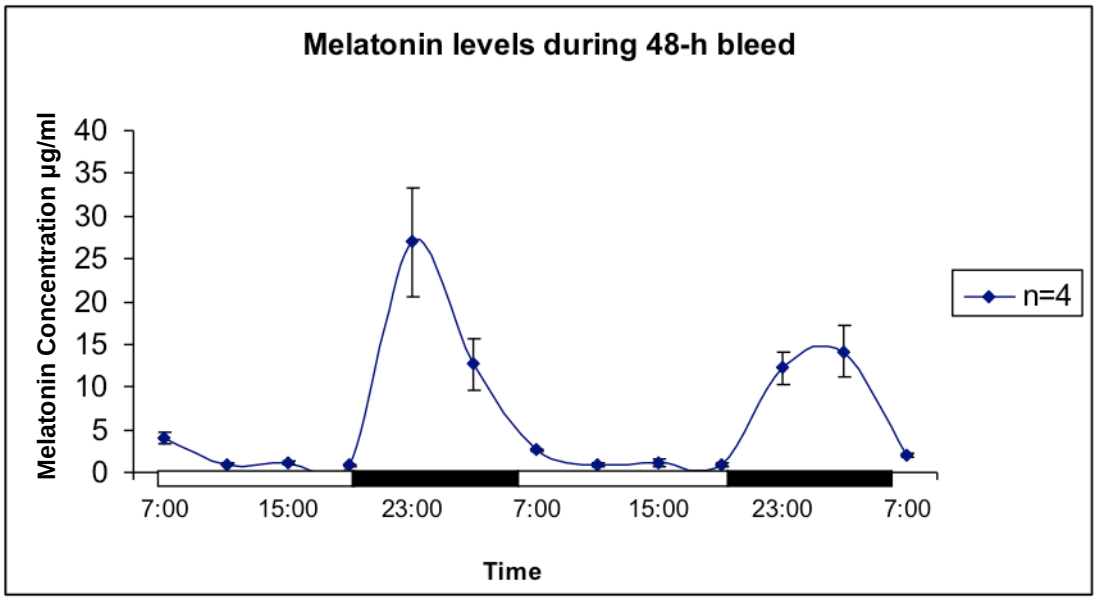
3.7 Although HeV is not yet a threat in South Africa, an outbreak could occur. Look at the route of infection. Give five specific strategies, other than vaccinations, that would prevent a horse contracting the virus.
Note: South African bats that could possibly transmit this virus are nocturnal and fruit eaters. (5)
[16]

QUESTION 4

Read the following advertisement (Figure 1) and interpret the line graph (Figure 2) and bar graph (Figure 3) to answer the questions that follow.

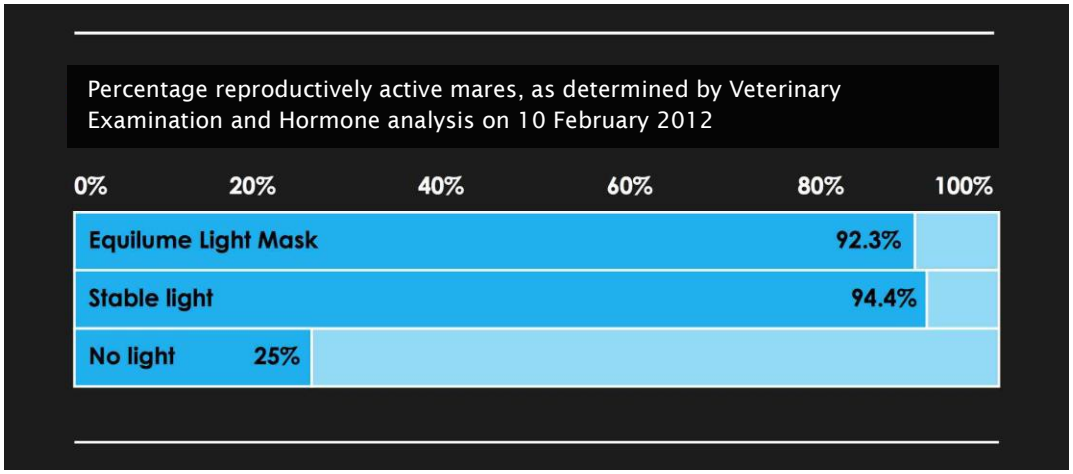
[Source: <http://equilume.com>]

Figure 1: Advertisement



[Source: <http://equilume.com>]

Figure 2: Line graph showing melatonin concentration over time



[Source: <http://equilume.com>]

Figure 3: Bar graph showing percentage reproductively active mares

4.1 Name two factors, other than increased daylight length, that will ensure mares start to cycle. (2)

4.2 How does the Equilume^{TM} Light Mask cause the mare to cycle early? (3)

4.3 At what time is melatonin production at its highest according to the line graph (**Figure 2**)? (1)

4.4 According to the line graph (**Figure 2**), what was the highest melatonin level? (1)

4.5 Which gland produces melatonin? (1)

4.6 According to the bar graph (**Figure 3**), which lighting method is most effective in getting the mares reproductively active? (1)

4.7 Give two reasons why you would use the Equilume^{TM} Light Mask if one could just use stable lights. (2)

4.8 How long is the horse's gestation period? (1)

4.9 Why would Thoroughbred racehorse studs NOT want their horses to have prolonged gestation periods? (3)

4.10 When is the Thoroughbred horse's birthday in the southern hemisphere? (1)

4.11 Name three of the major endocrine glands. (3)

[19]

QUESTION 5

5.1 Your horse has punctured its sole on a rusty nail. Explain the steps and procedures you would take in helping this horse. (5)

5.2 The shoe would have to be removed; explain how the vet or farrier would do this and what tools they would use. (5)

5.3 There are two methods of shoeing; give two advantages and two disadvantages for each method. Provide your answer in the form of a table. (8)

5.4 After four weeks of bandaging the horse's hoof, you notice a black, tarry substance in the frog sulci.

5.4.1 What could this be? (1)

5.4.2 What other problem could occur from prolonged bandaging of the foot? (1)

5.5 A horse has become cast in its stable.

5.5.1 Describe the position that this horse is in. (2)

5.5.2 How did the horse get into this position? (1)

5.5.3 Describe what should be done to safely correct this situation. (2)

[25]

QUESTION 6

6.1 Draw up a feeding schedule for a 3-year-old, 500 kg race horse in training. Include percentage protein to feed, concentrate to roughage ratio, total dry matter intake, correct calcium to phosphorus ratio. (7)

6.2 The horse is given a day off after its last race. How should its feeding be adjusted on this day and why? (2)

6.3 Which feedstuff has a particularly high phosphorus and low calcium ratio, and what condition can it lead to if a horse is fed just this unbalanced feedstuff? (2)

6.4 Explain digestion of cellulose and hemicellulose in the hindgut. (8)

6.5 Omeprazole is a paste given to horses for gastric ulcers.

6.5.1 Why would it be a good idea to have this race horse on this medication for gastric ulcers? (1)

6.5.2 What factors contribute to the formation of gastric ulcers? (3)

6.5.3 Give three signs of gastric ulcers in horses. (3)

6.6 6.6.1 Name two types of additives or supplements that can be added to a horse's feed. (2)

6.6.2 Explain why the additives or supplements in Question 6.6.1 are used. (2)
[30]

90 marks

SECTION C

QUESTION 7

Your friend sends you the following image of her horse. The horse is leaning back on its hind legs and so shifts weight from its front feet. It is lame and reluctant to move. Write an essay whereby you discuss this condition in detail, indicating all signs and predisposing factors, detailed anatomy, prevention, treatment and prognosis. Should your friend's horse recover, give her brief feeding guidelines for horses predisposed to this condition.

[Source: <http://www.worldhorsewelfare.org>]

50 marks

Total: 200 marks