



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2015

EQUINE STUDIES
MARKING GUIDELINES

Time: 3 hours

200 marks

These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.

SECTION A**QUESTION 1**

State whether the following statements are **True** or **False**.

- 1.1 True
- 1.2 False
- 1.3 True
- 1.4 True
- 1.5 False
- 1.6 True
- 1.7 True
- 1.8 True
- 1.9 False
- 1.10 True

[10]**QUESTION 2**

Select the correct answer in the multiple-choice questions below.

- 2.1 B
- 2.2 A
- 2.3 D
- 2.4 D
- 2.5 C
- 2.6 B
- 2.7 D
- 2.8 C
- 2.9 D
- 2.10 B
- 2.11 B
- 2.12 C
- 2.13 D
- 2.14 C
- 2.15 A

[15]

QUESTION 3

- 3.1. 3.1.1 splint bone
 - 3.1. 3.1.2 proximal sesamoid
 - 3.1. 3.1.3 distal sesamoid/navicular
 - 3.1. 3.1.4 pedal/phalanx 3/coffin
 - 3.1. 3.1.5 short pastern/phalanx 2
 - 3.1. 3.1.6 long pastern/phalanx 1
 - 3.1. 3.1.7 cannon/metacarpal (7)
 - 3.2 Splints, sesamoiditis, navicular, pedal osteitis, ringbone, fracture, shin splints (bucked shins) (7)
 - 3.3 Suspensory ligament (1)
 - 3.4 Common digital extensor tendon (1)
 - 3.5 Deep digital flexor tendon (1)
 - 3.6 Superficial digital flexor tendon (1)
- [18]**

QUESTION 4

- 4.1 4.1.1 oesophagus
 - 4.1 4.1.2 stomach
 - 4.1 4.1.3 jejunum
 - 4.1 4.1.4 caecum
 - 4.1 4.1.5 rectum
 - 4.1 4.1.6 anus
 - 4.2 pelvic flexure (1)
 - 4.3 It has the smallest diameter with the most significant change in diameter and the most bend. (1)
 - 4.4 Tapeworm (1)
 - 4.5 Right side (1)
- [10]**

QUESTION 5

- 5.1 Systole
- 5.2 Teasing
- 5.3 Anvil
- 5.4 Ureter
- 5.5 Lucern (5)

QUESTION 6

- 6.1 Breech position (1)
 - 6.2 After the hips are past the pelvic rim, the mare rests. This may put pressure on the umbilical cord causing the foal to suffocate as blood flow for oxygen is blocked, and the foal's head is still in the amniotic fluid. (3)
 - 6.3 One foot turned back. Would have to walk mare to stop contractions, push foal back and bring leg forward. Can continue to assist birth if mare is exhausted. (4)
- [8]**

QUESTION 7

- | | | |
|-----|----------------------|------------|
| 7.1 | Supraspinatus muscle | (1) |
| 7.2 | Rhomboideus muscle | (1) |
| 7.3 | Triceps | (1) |
| 7.4 | Longissimus dorsi | (1) |
| 7.5 | Panniculus muscle | (1) |
| | | [5] |

QUESTION 8

Fascia is the body's connective tissue (1) that permeates and surrounds every muscle, bone and organ. It binds the body together so that it may operate as one homogenous unit (1). Fascia has collagen fibres in it that give the fascia strength, elasticity and resilience (1).

The role of fascia is to strengthen, provide support and protection, and act as a shock absorber for the muscles (3). It provides an area for muscle attachment (1) and assists in movement of muscles and allows individual muscles to slide along each other without resistance or interference (1).

[4]**QUESTION 9**

Travelling tends to cause dehydration due to sweating and lack of access to water. Offer water every 3 – 4 hours on journey or at every rest stop. Soaked hay is best offered during any journey to increase water intake. Whatever is fed during transport (eg soaked sugar beet, high-fibre pellets with salt added) must have been incorporated into the daily diet prior to travel so preplanning is important. Bran mash is often thought to help retain fluid in the gut and stops dehydration causing colic. Extra electrolytes may be necessary. Feed from the ground and supplement Vit C to increase respiratory immunity as shipping fever may become evident from the long dusty hours of standing with the head raised.

[5]

SECTION B**QUESTION 10**

- Shoulder angle should equal pastern angle
- Scapular humerus angle should be about 90 degrees
- Hoof pastern angle should be about 45 degrees
- Dorsal hoof angle should equal heel angle
- Line down centre of cannon should end at back of heels
- Straight hoof pastern angle

[4]**QUESTION 11**

Low concentrate (starch) high roughage. Use oil for extra energy. Supplement Selenium and Vit E. Decrease feed on horse's day off.

[4]**QUESTION 12**

- 12.1 Lymphatic system is the body's drainage system; it is a network of blind ending tubules that follow the vascular system. Runs through lymph nodes empties into subclavian vein. (2)
- 12.2 Haemoglobin is the red blood pigment in the RBC that carries oxygen; it is a protein. Myoglobin is found in the muscle; it is a protein pigment that carries oxygen in the muscle. (4)

[6]**QUESTION 13**

Colostrum thick ✓ and yellow compared to normal milk ✓ colostrum has a higher energy ✓ and protein ✓ content, contains antibodies that normal milk does not ✓.

[4]**QUESTION 14**

Weight loss, halitosis, mouth ulcers, dry, staring or dull coat, polyuria and polydipsia.

[4]**QUESTION 15**

Wobbler disease or cervical vertebral malformation is when the neck vertebrae impinge on the spinal cord causing the horse to be ataxic or weak in the hind limbs. Usually seen in horses that are large for their breed size. Dangerous to ride these horses. Can have surgery done to stabilise vertebrae.

[6]

QUESTION 16

Miller's disease is when the horse is fed a diet of bran that is high in phosphorus and low in calcium, the opposite of the required 2:1 ratio of Ca:P. It results in calcium having to be extracted from the bones. First takes from non-weight bearing bone like the skull, which causes the bone to soften and become inflamed causing big head/bran disease/miller's disease (Nutritional Secondary Hyperparathyroidism) to become evident.

[5]**QUESTION 17**

To discuss traction, wear, sole bruising, expansion of heels and health of hoof.

[5]**QUESTION 18**

- 18.1 The faster the horse's heart rate returns to normal after exertion, the fitter the horse is. Take heart rate before at facial artery; take heart rate every 5 – 10 minutes to check when back to resting rate. Used in cross-country and endurance.
- 18.2 Jugular vein
- 18.3 Easier into a vein, thinner wall, lower pressure and more superficially located.

(5)**(1)****(4)****[10]****QUESTION 19**

There are 20 different amino acids that make up protein. Ten of these are essential because they cannot be synthesized and must be supplied in the diet.

The other non-essential amino acids can be synthesized in the liver by the horse. When the horse does not receive essential amino acids in the diet, it will restrict protein production that requires this amino acid in its make up, such as the essential amino acid Methionine to produce Biotin protein for the hooves. If there is no methionine, the hooves will become brittle and weak due to no biotin being formed.

[4]**QUESTION 20**

90% of colics respond favourably to medical treatment within the first hour. Those that continue to show pain and discomfort may need surgery to fix the colic.

- 20.1 Increased heart and respiration rate, sweating, pawing, rolling, looking at flank, grunting/groaning, grinding teeth.
- 20.2 Remove cause of colic. Essential to look after wound and it can become infected and dehisce if not seen to daily. Follow all instructions given to you by the vet. Watch for urination and droppings. Water intake is important; some may be on a drip. Introduce feed slowly: often soaked, chopped hay, then fresh grass, and only once started going out again, concentrates. Stall rest, then in-hand walking, then paddock time, and then slow-ridden work.

(4)**(4)****[8]**

QUESTION 21

Simple carbs: The breakdown of sugar and starch takes place in the small intestine by gut enzymes produced by the horse. They are broken down into monosaccharide units (glucose, fructose, mannose, etc.), which are easily absorbed. If overfed starch, the undigested starch will spill over into the hind gut where bacteria will ferment it causing an acidic environment. This acidic environment can cause discomfort, diarrhoea, colic, laminitis, death of other good bacteria, endotoxin release and other health problems. Lactic acid produced by fermentation of this simple carbohydrate is what causes a horse to become 'hot' and overexcited when being ridden.

Complex carbs: Fibre occurs mainly in plant cell walls and plays a structural role of holding a plant up. Gut microbes, also known as microflora, that reside in the hindgut, are responsible for the digestion of fibre. This microbial fermentation of fibre produces vitamins and volatile fatty acids (VFAs). VFAs are a source of energy and stimulate gut cell proliferation, helping to boost gut health. There are many different types of microbes in the gut, and their numbers fluctuate depending on the horse's diet as each microbe digests a certain type of fibre.

There are three VFAs:

- acetic acid (acetate)
- butyric acid (butyrate)
- propionic acid (propionate)

Acetate and butyrate enter the metabolic energy pathways directly. Propionate is first transported to the liver where it is converted to glucose.

[10]

SECTION C**QUESTION 22**

Cause: Recurrent Airway Disease (RAD) also known as RAO (Recurrent Airway Obstruction), chronic obstructive pulmonary disease (COPD), heaves, broken wind. A chronic, non-infectious, hypersensitivity or inflammatory reaction to dusts (organic and hay), moulds and fungal spores. Most often in stabled horses. The allergic response causes bronchospasm and mucus accumulation. Inflammation of small airways (bronchiolitis) results in an increased effort to expel air. Once horses show symptoms, they have the condition for life. Similar to asthma in humans.

Clinical signs: affects horses more than six years of age. Early cases have intermittent cough, increased respiratory rate and expiratory effort (abdominal component), and reduced exercise capacity. More severely affected cases show nasal discharge, heave line from expiratory effort, inspiratory distress, flaring nostrils, anorexia, weight loss and depression. Respiration rate is usually more than 20 breaths per min.

RAD is a disease that affects the air passages (trachea, bronchi, and bronchioles) through which air flows into the lungs. The air passages are lined with layers of cells, which constitute the epithelium. Below the epithelium is a layer of connective tissue called the submucosa. The epithelium and submucosa together are called the mucosa. Smooth muscle surrounds the bronchi and bronchioles all the way to the level of the alveoli (the air sacs in the lungs where gas exchange takes place). Contraction of the smooth muscle encircling the airways is known as bronchoconstriction or bronchospasm.

Airway mucus is produced in the trachea and bronchi by goblet cells in the epithelium and submucosal glands. Mucus lining the airways is viscous and sticky so that it entraps inhaled particles. The epithelium of the trachea and bronchi are covered with cilia. These tiny hairlike projections on the epithelial surface beat continuously and transport the overlying mucus layer up toward the larynx where the mucus can either be expelled (by coughing) or swallowed.

Diagnosis: history and clinical are usually all that is needed for a diagnosis. A wheeze at the end of respiration is one of the clinical signs; in mildly affected horses a rebreathing bag is used to accentuate respiratory noises. Endoscopy shows increased exudate/mucus in trachea and cytology on exudate/mucus and BAL (bronchial alveolar lavage) shows an increased percentage of neutrophils and no evidence of bacterial infection. Lastly, bronchodilators can be used diagnostically. Atropine administered I/V will relieve symptoms of bronchospasm and dramatically reduce respiratory rate and effort; beware of gut stasis and colic when administering atropine!

Treatment: 3 principles, 1) environmental control, 2) use of corticosteroids to reduce inflammation, 3) administration of bronchodilators to relieve respiratory distress.

Environment: horse should be out – not stabled at all; if has to be stabled, must be dust free, well ventilated and use alternate bedding such as shredded newspaper (changed daily – no more deep litter system), sand and sunflower husks and rubber matting. Soak hay – just wetting will not help, all other feeds should be moistened. Cubes better than coarse mix and complete feeds may be advantageous. Haylage would be a good alternative if available in SA. Good quality hay. Feed from floor to encourage drainage of excess mucus. Barn-style stables – all horses require same treatment to avoid contamination of the air. Groom horses outdoors so dust does not fill air in the stables.

Anti-inflammatory: corticosteroids systemically or via inhalation with aero mask to reduce reaction and inflammation. Inhalation medication has no systemic side effects and gets to work at the site of inflammation.

Bronchodilators: they are rescue medication as they do not treat the airway inflammation. Ventipulmin is the most common bronchodilator used in horses.

Remember, one month outdoors can mean the horse is 100% fine but five minutes in the stable and you will see signs of respiratory distress for four months.

[50]

50 marks

Total: 200 marks

RUBRIC: ESSAY EVALUATION

Criteria	5	4	3	2	1	
Writing skills organization	The essay is very well organized. It exhibits command of focus, coherent organization, and interesting development. Body paragraphs develop ideas well and the argument flows very well throughout the essay.	The essay is well organized. It exhibits command of focus, coherent organization, and interesting development. Body paragraphs develop most ideas well and the argument flows throughout the essay.	Organization is satisfactory. Essay exhibits some command of focus and is developed fairly well. Most body paragraphs develop some ideas well and the argument flows for the most part.	This essay does not have a consistent focus. Some attempt at organization is visible, but the essay is not structured well. The writer 'jumps' from idea to idea, and the information seems to lack purpose.	This essay lacks proper organization. Ideas seem to be thrown together without a consistent sense of development or focus. It reads like a random collection of ideas.	/5
Writing skills Grammar	Exhibits excellent command of expression (grammar, sentence structure, sentence variety). - Complete sentences - No to few grammatical/spelling errors. The writer does not make any mistakes and the prose flows exceedingly well.	Exhibits excellent command of expression (grammar, sentence structure, sentence variety). There are only minor errors, and they are minor and do not impede the flow of this essay. - Complete sentences - Only minor grammatical/spelling errors	Exhibits a satisfactory command of expression (grammar, sentence structure, sentence variety). The prose flows relatively well, but there are errors and they occasionally impede the flow of this essay. Occasional incomplete or run-on sentences Grammatical and spelling errors	Exhibits a weak command of expression (grammar, sentence structure, sentence variety). There are many errors, which impede the flow of this essay. Many sentences are awkward and poorly constructed. May have incomplete or run-on sentences May contain many spelling and grammatical errors	There are many grammar or spelling errors that distract the reader from the content. Most sentences are awkward and poorly constructed. The piece does not flow. Many serious writing errors - Major structural deficiencies - Logic of the essay not clear	/5

Knowledge: anatomy 5, nutrition 10 and health care 25	• Thorough knowledge of the topics or topic discussed in the essay • No omission of material significant to the argument • No significant factual errors • Names correctly spelled • Factual knowledge appropriate to the subject and required by the discussion provided • Fully addresses the assigned question • All necessary information supplied to reader (Responds precisely to topic, indicating an excellent grasp of the topic. All key concepts, themes, issues, ideas are thoroughly identified, explained, and analyzed. The essay indicates an exceptional understanding of the material.) X8 (40 – 33)	• Good knowledge of the topic or topics discussed • Only minor omissions of material significant to the argument • Few factual errors • Names correctly spelled • Most factual knowledge appropriate to the subject and required by the discussion provided • Addresses the assigned question. Most necessary information supplied to reader (Responds precisely to topic, indicating an excellent grasp of the topic. Most key concepts, themes, issues, ideas are identified, explained, and analyzed well. This response indicates a good understanding of the material.) X8 (32 – 25)	• Overall knowledge of the topic or topics sound, but places where that knowledge is not complete • Some material significant to the argument omitted • Several factual errors • Names misspelled • Does not provide all the necessary factual knowledge required by the discussion • May wander off the assigned question. Some knowledge assumed on part of the reader (Some key concepts, themes, issues, ideas are identified, explained, and analyzed. This response indicates a satisfactory understanding of the material) X8 (24 – 17)	• Evidence of gaps in the knowledge of the topic or topics, but does have some knowledge • Material significant to the argument omitted • Significant factual errors or garbled information • Names misspelled • Fails to provide significant factual information required by the discussion. The reader may not be supplied with the information needed to understand the essay (The response does not address many key concepts, themes, issues, or ideas. Some ideas are identified, but the explanation is limited. This response indicates a limited/partial understanding of the material.) X8 (16 – 9)	• Serious gaps in knowledge • Multiple factual errors • Important evidence missing • Names are misspelled • Little necessary supporting information • Off-topic (automatic unsatisfactory, no matter how good the essay otherwise is) Most knowledge on the part of the reader assumed (The response lacks a proper analysis of key concepts, ideas, themes, and issues. There is no critical analysis of the material. The response is very vague, general, and/or short.) X8 (8 – 0)	/40 /50
Total						