



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2014

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**

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

[10]**QUESTION 2**

- 2.1 D
- 2.2 B
- 2.3 A
- 2.4 D
- 2.5 B
- 2.6 D
- 2.7 B
- 2.8 C
- 2.9 B
- 2.10 A

[10]**QUESTION 3**

- 3.1 Frog
- 3.2 Pedal bone/ coffin bone/ third phalanx
- 3.3 Navicular bone/ distal sesamoid
- 3.4 Digital cushion
- 3.5 Deep digital flexor tendon
- 3.6 Long pastern/ first phalanx
- 3.7 Interphalangeal joint/ pastern joint
- 3.8 Short pastern/ second phalanx
- 3.9 Common digital extensor tendon
- 3.10 Coronary band or periople
- 3.11 Hoof wall
- 3.12 Sensitive lamella
- 3.13 White line
- 3.14 Sole

[14]

QUESTION 4

- 4.1 Loop of Henley/ nephron
- 4.2 Bowmans capsule/ glomerulus/ malphigian body/ nephron
- 4.3 Cortex
- 4.4 Medulla
- 4.5 Renal pelvis
- 4.6 Ureter

[6]**QUESTION 5**

- 5.1 Roaring/ recurrent laryngeal neuropathy
- 5.2 Caecum
- 5.3 Lucern
- 5.4 Wolf tooth
- 5.5 Ermine markings

[5]**QUESTION 6**

- 6.1 Corner insisors only touch on front surface
- 6.2 All permanent teeth are out/ no deciduous teeth (milk teeth) left in mouth
- 6.3 Hook on corner incisor
- 6.4 Tush prominent (one tush or 2 tushes). Also known as canines; bridle teeth
- 6.5 Galvynes groove appears on corner incisor
- 6.6 Angle of incidence increasing (Shape of tables from oval to triangular)

[6]**QUESTION 7**

- 7.1 Cardiac, skeletal/ striated/ voluntary muscle, smooth/ unstriated/ involuntary muscle (3)
- 7.2 Azoturia Monday morning disease, reccurent exertional rhabdomyolitis (RER), myoglobinuria (3)

[6]**QUESTION 8**

- Pastern joint
- Fetlock joint
- Hock joint
- Stifle joint

[4]

QUESTION 9

- 9.1 To control stallion when breeding
Before a race
Extra control while being examined by a vet (3)
- 9.2 In the paddock
Left in stable
Sensitive or sore mouth (3)
- 9.3 Chifney bit (1)
[7]

QUESTION 10

- 10.1 A 37,5 – 38,5
B thermometer
C 36 – 42 BPM
D digital palpation, stethoscope
E 12 – 15 BPM
F watch flank movement (6)
- 10.2 Each horse will have its own normal range and therefore you will know for definite when that particular horse's vital signs are abnormal. (2)
[8]

QUESTION 11

(½ mark each) Any four:

Nose twitch with or without twitching device
Devils grip/neck twitch
Lift one leg cross ties
Sedation/chemical
A crush / stock halter/ headcollar and lead rope
hobbles

[2]**QUESTION 12**

(½ mark each) Any four:

Per os (into the mouth)/ drench
I/V intravenous
S/C subcutaneous
intranasal spray
I/M intra muscular
I/A intra articular

[2]

80 marks

SECTION B**QUESTION 13**

- 13.1 High energy, low in fibre for a horse in moderate work (1)
- 13.2 2:1 (1)
- 13.3 Pellets (1)
- 13.4 Increase calcium increase protein make horse chew food more (2)
- 13.5 Balanced feed with vitamins and minerals and the correct energy and fibre (2)
- 13.6 Change of diet can cause colic and diarrhoea therefore must change the diet gradually over time (2)
- 13.7 To decrease the volume of feed being fed and oil is slow release energy, good for coat (2)
- 13.8 Oil can easily go rancid (spoil) when contained in high amounts in feed. Vit E is a free radical scavenger which will delay the oil going off. (2)
- 13.9 The individual horse may be a poor or good doer (over or underweight), weight of horse and amount of moderate work vary with each horse (2)
- 13.10 Split into 3 meals a day of 1,6 kg as horses should not eat more than 2 kg at each feed (2)
- 13.11 2.5% of 600 kg = 15 kg (2)
- 13.12 Hay is important for ensuring even wear of teeth, gut fill (bulk/fibre) stomach and intestines, gut lining cell health, gut lining immune system, energy VFA's, healthy population of gut bacteria and microbes. (3)
- 13.13 30:70 (1)
- [23]**

QUESTION 14

- 14.1 growth nutrition from milk
- 14.2 work breed
- 14.3 lactation reproductive status

[6]

QUESTION 15

A very broad classification of colic involves the following:

- Tympanic (gas) colic
- Impaction colic
- Torsion (strangulating obstruction) colic
- Displacement of bowel
- Inflammatory disorders: colitis and anterior enteritis.
- Non-strangulation infarction: thromboembolic colic often from *Strongylus vulgaris* migration.
- Non GIT (false colic)
- Sand colic
- Foal colic: first 48 hours, meconium retention, rupture of bladder, umbilical and inguinal hernias.

(5)

PREDISPOSING FACTORS IN COLIC

- Overeating – small stomachs and sudden access to large quantities of cereal or lush grass
- Stress – change in routine, feeding, stables and friends
- Irregular work with full feed or feed to soon before and after work
- Cold water after hard work
- Poor quality or insufficient roughage
- Lack of teeth care
- Bolting feed
- Poor parasite control
- No water – lack of/or poor access to clean water

(5)

[10]**QUESTION 16**

- 16.1 Contagious – disease passed directly from horse to horse; infectious caused by bacteria and viruses that get into body from environment. (2)
- 16.2 Infectious – AHS, tetanus, botulism, EHV; contagious – strangles, rabies, EIV, EHV (2)
- 16.3 Isolation – where one horse is kept by itself away from any other horses, e.g. influenza. Quarantine of stables – no horse is allowed to leave the yard until declared free of the disease that caused the quarantine, e.g. strangles. (2)
- 16.4 Vector transmits a disease, e.g. *Culicoides* midge with AHS. Intermediate host is needed to complete the pathogens life cycle – Tapeworm needs mite. (4)

[10]

QUESTION 17

Advantages: helps prevent impaction colic when water is not drunk on long trips because the bran holds water in the gut. Horses like the taste of bran mash so more happy to eat during transport and they take in water with the mash. (2)

Disadvantage: if horse not used to bran sudden change in feed on trip may cause diarrhoea or colic. Bran is unbalanced with Ca : P so should not be fed long term without supplementing Ca. (1)
[3]

QUESTION 18

18.1 Horse 1: sloping and long scapula. Horse 2: upright and short scapula. (2)

18.2 Horse 1 (1)

18.3 Longer stride – covers more ground with less effort or energy used more area on scapula for muscle attachment. (2)

18.4 Short choppy stride with lots of knee action (2)

18.5 Driving/ cart pulling as has more pulling power (2)
[9]

QUESTION 19

19.1 As horse starts to exercise the muscles will require more oxygen and energy. Heart pumps blood to muscles with nutrients and oxygen in it, so as the requirements increase the heart rate and stroke volume will increase. As this increases respiration will increase to better perfused the increased blood flow through the lungs and to get rid of the large amounts of CO₂ produced during muscle contraction. (3)

19.2 Dehydration is when there is less water in the body. If the horse's body is short of water the concentration of salts within the blood will be too high. This is detected by specialised brain cells which instruct the pituitary gland to secrete ADH (antidiuretic hormone). ADH causes the kidney to increase its reabsorption of water, resulting in concentrated urine being excreted. This in turn increases the body water thereby diluting out the salt content. (6)
[9]

70 marks

SECTION C

QUESTION 20

Signs of impending parturition:

- Development of an udder (bag-up) – the mammary gland enlarges to contain increasing amount of milk. Some mares show udder development early on while others leave it till the last minute, which is especially true of the maiden mares.
- The teats will start to fill, some mares may run milk which is a concern if they lose the first milk or colostrum. Collect this milk and freeze it in case you need it for the foal later.
- Waxing up is when a drop of milk on the end of the teat dries to form a waxy looking bead. Can be unreliable but is a sign that foaling is likely within the next 24 – 48 hours.
- Pelvic area begins to relax – can be very noticeable and the mare looks as if she is in poor condition across her hindquarters as she will develop hollows on either side of the top of the tail. This relaxation helps to ease the passage of the foal through the birth canal. The mare's tail rises with this relaxation process.
- The vulva will begin to relax and lengthen a few days before foaling.
- Changes in the abdomen are noticed, for a 'point' at the bottom of the belly as it drops
- Dilation of the cervix cannot be seen, but sometimes the mucus plug from the cervix is released.
- The milk veins on the mare's belly become distended and dilated.
- The mare will often become restless and isolate herself.
- She may show signs of colic – swishing tail, kicking at or looking at her flank, get up and down repeatedly and generally restless. She will however still eat a little, pass stool and urinate.
- Mare starts to sweat as she gets close to the start of labour. It is called steaming up and it is a distinct type of sweating compared to that caused by exercise, and can be sudden in onset.

STAGE 1: Preparation and positioning

Stage one is from the first contractions until the water breaks. It is during this stage that the mare becomes restless and starts sweating up. She may get up and down several times, helping to position the foal. Signs can look like colic. The duration of stage one will vary from a short time to several hours.

Hormones cause cervical softening, vulval relaxation and increased vaginal mucus secretions along with contractions of the uterus. Uterine pressure from contractions and the mare's movements help the foal get into the correct position for a smooth delivery. The foal will extend its forelimbs and head, turning into an upright position with its forelegs and muzzle pressed against the cervix. As the cervix dilates and uterine pressure increases, the placental membranes bulge through the opening in the cervix, assisting with its dilation. The allantochorion membranes bulge until they rupture at the cervical star, releasing the allantoic fluid (this fluid helps lubricate the birth canal). This breaking of the water marks the end of stage 1. Once stage one is recognised the mare's tail should be wrapped and her hindquarters and udder cleaned.

STAGE 2:

The second stage is the time from the breaking of the waters until the birth of a foal. In normal circumstances this stage lasts 25 minutes, but can be anything from 10 minutes to one hour. An opaque whitish-blue bag (the amnion) will appear out the vulva. This has a balloon like appearance and should contain one of the foal's forefeet. The foal should present in a diving position, with its second foot just behind the first (positions shoulders correctly for easy passage through the pelvic canal) with the muzzle and head lying on top of the fetlock area. At this early stage it is easy to check that the foal is in the correct presentation by feeling if there are two hooves with the soles facing down and forward, with a muzzle above them. If this is done a sterile obstetric glove must be used or hands and arms scrubbed and disinfected correctly. The amnion can also be checked. If the fluid is stained and not of its normal clear consistency, this could mean the foal is in distress from, either before or during this stage of labour.

This stage is characterised by very strong contractions of the abdominal and uterine muscles. The mare usually positions herself on her side with her legs fully extended to facilitate voluntary straining. The most difficult part is getting the foal's shoulders through the pelvic canal, this usually corresponds to when the foal's poll passes through the vulva. After this critical time the mare usually rests for a short time and then delivers the rest of the foal with relative ease. The amniotic membrane usually tears as the foal is born, but if it is not, it should be torn open so that the foal does not suffocate. After the foal's hips have passed through the mare's pelvis, the mare rests once again. The foal's hind legs may remain in the mare's vagina for several minutes, which may encourage the mare to rest and stay lying down. This rest period also allows the foal to receive essential blood, oxygen and nutrients from the placenta via the umbilical cord, and should not be interrupted. The cord should break naturally when either mare or foal moves, and it is at this time that the 4 – 5 cm umbilical stump on the foal can be dipped in iodine. Once the mare is up and the cord broken, the protruding placenta should be tied up out of the way so that the mare does not step on or damage it.

STAGE 3:

The third stage is from straight after the actual birth, when the umbilical cord is broken, until the placenta or afterbirth is expelled. This usually happens within 30 minutes, with some straining and discomfort but no obvious pain, but this stage can take up to 3 hours. If the mare shows signs of prolonged pain and/or sweating, this could indicate uterine haemorrhage. The placenta is held to the uterus wall by small interlocking buttons called microcotyledons, these 'buttons' have to detach in order for the placenta to come out. You should never attempt to pull the placenta out as it may tear and leave small pieces behind; this is also the reason why it should be tied up out of the mare's way. Retention of even the smallest piece of placenta can result in a potentially serious condition such as laminitis or toxæmia.

Dystocia is a term used to refer to any abnormality that prevents delivery of the foal by the mare's efforts alone. A uterus that cannot contract (uterine inertia) would be termed a maternal dystocia, while incorrect position of the foetus is a foetal dystocia. A large percentage of dystocias result in dead, seriously weakened, or oxygen deficient foals. Time is of the essence with dystocia and the following are signs that may appear if there is a problem:

- Failure of the white amnion to appear soon after the mare's water breaks
- Appearance of the red chorio-allantois instead of the white amnion at the beginning of stage two (red bag or placenta previa)
- Appearance of white amnion without both limbs and/or without the foals head
- Absence of straining for long periods during stage two of labour
- Presence of straining without any progression with respect to the foals delivery
- Repeated shifting and rolling of the mare during any stage, but especially during stage two

Mutation (manipulation of the foal's position) and traction (pulling the foal in an arc towards the mare's hocks as contractions occur) can be used to correct some forms of dystocia. The longer one waits, the tighter the uterus clamps down on the foetus and the less lubrication there is, making it difficult to manipulate the foal. Drugs can be given to relax the uterus so an attempt at mutation can be made. If the dystocia cannot be corrected by manipulation, there are two surgical options available. If the foal is alive a caesarian can be performed, but it does predispose the mare to metritis and the development of scar tissue. If the foal is dead, a fetotomy can be performed when the foal is cut up in the uterus and removed in the smaller pieces.

PLACENTA PREVIA: If the cervical star area of the allantochorion does not break to let the amnion through, this is called red bag or placenta previa. This usually happens if the allantochorion is unusually thick or if it releases from the uterus prematurely, labor contractions can force this intact membrane out through the cervix and into the vagina, eventually protruding through the vulva as a thick red allantochorion. Premature detachment of the placenta can lead to oxygen deficiency and eventual brain damage or suffocation in the amniotic fluid. Degeneration of this allantochorion attachment may be from a disease process in the mare's reproductive tract, and may affect the foetus.

If this is seen the red allantochorion should be ruptured as soon as possible (scissors may be needed). Delivery must then proceed rapidly to avoid suffocation, the foal's position should be checked and the amion and fluid removed from its nostrils.

[50]

50 marks

Total: 200 marks