CASE-BASED EXAMINATION INSTRUCTIONS

The case-based examination measures surgical principles in case management prior to, during, and after surgery. Information about these cases is presented in the form of images, videos, and data. Visual information will be projected on the screens. Data and text will be given in your exam binder. Information given on the screen is not shown on the question page. **OBSERVE ALL INFORMATION PRESENTED ON THE SCREEN PRIOR TO ANSWERING QUESTIONS IN YOUR EXAM BINDER.**

On the front cover of your binder is a sticker that shows your candidate ID number. Please confirm at this time that the ID number on the cover of the binder is your ID number. If it is not your ID number, let a proctor know immediately.

The examination binder consists of XX pages of questions, each related to a corresponding screen image. Each image presented on the screen will correspond with one page of the exam. The screen image will show the corresponding page number in your examination binder.

For some images, particularly radiographs and ultrasounds, the lights will be dimmed for approximately one minute after you have had a chance to read the question. You will have approximately 30 seconds to read the question before the lights are dimmed.

If a question asks for a specific number of responses, you will be graded on only the requested number of answers. Additional responses beyond the number requested will not be graded. For instance, if we ask you for one diagnosis, and you give us two, we will grade only the first answer. Minimize the use of abbreviations to make sure your answer is clearly understood. Commonly used medical abbreviations may be used; however, if you are concerned that the grader may not understand the abbreviation, you should define it.

You will have either two minutes, four minutes, six minutes or eight minutes to respond to the questions on each page. The time allotted for each page will be indicated on the top of the page, as well as the top of the corresponding screen image. A one-minute warning will be issued prior to changing each image.

If we experience technical difficulties while showing an image, the time will be stopped and will resume after the problem has been corrected. You will still receive the full amount of time for that question.

When the allotted time is up for each question, you will be instructed to turn the page in your binder to the colored plastic divider that follows. Once you turn to the plastic divider, you may **NOT** go further in the exam until instructed to do so. Therefore, when instructed to do so at the end of each question, you will turn the page to the plastic divider and wait for instructions before turning the plastic divider to the next test question.
UNDER NO CIRCUMSTANCES ARE YOU ALLOWED TO MOVE FORWARD IN THE EXAMINATION UNTIL INSTRUCTED. FURTHERMORE, YOU MAY NOT RETURN TO A PREVIOUS PAGE OF QUESTIONS AT ANY TIME DURING THE EXAM. FAILURE TO FOLLOW THESE INSTRUCTIONS WILL RESULT IN DISQUALIFICATION FROM THE EXAM.

Scrap paper has been supplied for you to take notes during the exam. You are encouraged to use the scrap paper throughout the exam. You can refer to the notes on your scrap paper for the entire duration of the exam. Your scrap paper will not be scored.

Raise your hand if you need additional pencils, have a question, or if you need to leave the room for any reason. We highly recommend that you do not leave the examination for any reason since questions cannot be revisited once they have been shown.

Are there any questions before we begin the exam?
This is an image of a 450-kg, 7-year old Thoroughbred Horse. The horse was normal the previous evening. This morning he was found in the pasture with a Grade V/V left fore limb lameness. Hoof tester evaluation and flexion of the distal limb were negative.

1. Based on the history and the image presented, list three differential diagnoses for this horse.

   a. ______________________________________________________

   b. ______________________________________________________

   c. ______________________________________________________

2. List three specific physical exam procedures of the limb you would perform to further examine this horse.

   a. ______________________________________________________

   b. ______________________________________________________

   c. ______________________________________________________
A painful response and crepitus were elicited upon manipulation and flexion of the cubital joint. There is a superficial abrasion present over the proximal lateral aspect of the antebrachium. If the carpus is maintained in extension, the horse can bear weight on the affected limb.

1. Based on your physical examination findings, what is the most likely diagnosis in this horse? Be specific

2. Based on your physical examination findings, what is the next most appropriate diagnostic procedure you should perform? Be specific
You take medial-to-lateral and cranial-caudal radiographs of the left elbow.

1. Completely describe the radiographic abnormalities. **Be specific**

   _______________________________________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________ 

2. What is your treatment recommendation for this horse? **Be Specific**

   _______________________________________________________

   _______________________________________________________

You decide to treat the fracture by internal fixation with a bone plate.

1. List four perioperative medications (route and dosage) you will administer to this horse.

<table>
<thead>
<tr>
<th>Medication</th>
<th>Route</th>
<th>Dosage (units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. With respect to correct application of the bone plate:
   a. Where on the ulna will you place the plate?

   ______________________________________________________

   b. Placement of the plate in this location will achieve what biomechanical principle?

   ______________________________________________________

3. List in order, between the skin/subcutaneous tissue and the olecranon, the tissues or anatomical structures you will encounter during your surgical approach.

   a. ______________________________________________________
   b. ______________________________________________________
   c. ______________________________________________________
   d. ______________________________________________________
1. **Image 1-4** are bone plates commonly used for fracture repair in adult horses. Identify the implants.

   Image 1: ______________________________________________________
   Image 2: ______________________________________________________
   Image 3: ______________________________________________________
   Image 4: ______________________________________________________

2. Which **one** of these plates would be most appropriate to repair the fracture in this 450-kg horse?

   ______________________________________________________

3. Name the optimal type and size of ASIF screw you will use to secure the selected implant.

   ______________________________________________________

4. Name the appropriate size of drill bit and the tap to place this screw in the position screw technique.

   Drill bit: ______________________________________________________
   Tap: ______________________________________________________

5. List **one** advantage and **one** disadvantage of using the bone plate in **Image 4** as compared to using the plate in **Image 2**.

   Advantage: ______________________________________________________
   ______________________________________________________
   Disadvantage: ______________________________________________________
   ______________________________________________________
1. **Images 1-4** are instruments commonly used for equine fracture repair. Identify the instruments.

Image 1: ______________________________________________________
Image 2: ______________________________________________________
Image 3: ______________________________________________________
Image 4: ______________________________________________________

2. What is achieved at the fracture site by using the instrument in **Image 1** compared to using the instrument in **Image 2**. **Be specific**

________________________________________________________________
________________________________________________________________

3. How would you prepare the plate to ensure optimal fracture reduction?

________________________________________________________________
________________________________________________________________

4. Because of expense, you elected to use only **four 5.5-mm cortical screws**, the rest of the screws being 4.5-mm cortical screws. Where on the plate should the **5.5-mm screws** be used to maximize the strength of your plate fixation?

________________________________________________________________
________________________________________________________________
1. When applying the plate, you strip a 5.5-mm, neutral, fully threaded cortical screw. What would be an option to fill this screw hole?

____________________________________________________________________

____________________________________________________________________

2. You decide to augment your repair with an autogenous cancellous bone graft. List three possible sites for harvesting the graft in this horse.

a. ______________________________________________________

b. ______________________________________________________

c. ______________________________________________________

3. List three physiologic functions autogenous bone grafts perform to augment bone healing

a. ______________________________________________________

b. ______________________________________________________

c. ______________________________________________________
The fracture is repaired with a 4.5 narrow dynamic compression plate. Intraoperative radiographs are performed and are depicted in the **Image**.

1. Identify **three** technical errors. **Be specific.**
   
a. ______________________________________________________
   
b. ______________________________________________________
   
c. ______________________________________________________

The horse has a difficult recovery from anesthesia. After three attempts to stand, the horse is standing, but non-weight bearing on the left forelimb.

2. What is the most likely differential diagnosis for this lameness?
   
   ______________________________________________________

3. What **one** diagnostic modality would you perform to evaluate this horse?
   
   ______________________________________________________
You obtain radiographs of the left elbow.

1. Completely describe the radiographic abnormalities. **Be specific.**

   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

2. What biomechanical effect was produced by leaving the two screw holes open in your initial plate fixation?

   ______________________________________________________

The owners elect to continue treatment.

3. List the implants you would use in the second repair. **Be specific.**

   ______________________________________________________
   ______________________________________________________
   ______________________________________________________

The fracture is repaired and antimicrobial therapy is continued for 7 days postoperatively.
Ten days after surgery, the horse becomes non-weight bearing lame on the left forelimb. There is periarticular, diffuse pitting edema present over the lateral aspect of the cubital joint. Palpation and flexion of the elbow elicits a marked pain response.

1. Based on this history and the clinical description, list the three most likely diagnoses for this horse.

   a. ______________________________________________________

   b. ______________________________________________________

   c. ______________________________________________________

2. List four steps you would take to obtain a definitive diagnosis in this horse.

   a. ______________________________________________________

   b. ______________________________________________________

   c. ______________________________________________________

   d. ______________________________________________________
Radiographs of the fracture fixation were obtained and demonstrated that the implants were intact. No bone lysis was evident. The Image is a lateral view of the cubital joint.

1. Name the landmarks for arthrocentesis of the cubital joint labeled A, B, C, and D in the Image
   A. ________________________________
   B. ________________________________
   C. ________________________________
   D. ________________________________

2. Indicate with an “X” on the diagram below two separate locations for performing arthrocentesis of the cubital joint.

Arthrocentesis of the cubital joint yielded a turbid, yellow joint fluid with a poor mucin clot. A synovial fluid sample was obtained and analysis and cytologic evaluation of the fluid was performed and the results are presented below.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>7.0</td>
</tr>
<tr>
<td>Total Protein</td>
<td>4.5 g/dl</td>
</tr>
<tr>
<td>Nucleated cell count</td>
<td>63,000 cells/ul</td>
</tr>
<tr>
<td>Glucose</td>
<td>40 mg/dl</td>
</tr>
</tbody>
</table>

3. What is your diagnosis? ________________________________

DO NOT CONTINUE TO THE NEXT PAGE UNTIL INSTRUCTED
**Image 1** is a direct smear of the synovial fluid. **Image 2** is of a slide prepared from the synovial fluid.

1. Describe and interpret the cytology in **Image 1**

_____________________________________________________

_____________________________________________________

_____________________________________________________

2. Name the test performed in **Image 2** and characterize the organisms identified by the arrows

   Test:  _____________________________________________________

   Organisms:  _____________________________________________________

3. What is the most likely organism involved?

    _____________________________________________________

4. List three methods of submitting synovial fluid for culture that maximize your chance of isolating an organism. **Be specific**

   a.  _____________________________________________________

   b.  _____________________________________________________

   c.  _____________________________________________________

*This Concludes the Large Animal Orthopedic Case-Based Examination.*