Examples of written answers.

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The ability to pass your diploma exam isn't just dependant on learning the theory work (although this is essential), it is also having the ability to get all the information out of your head and onto the paper in an orderly and accurate manner. The diploma exam is not a test of your memory, it's an exam to test your competence and understanding.

Set out in this section are 3 answers to the same question. One is answered at fail level, one at pass level and one at honours level. I have highlighted the areas where the answers below are good, bad & outstanding.

All answers were written in real time with closed book. The time taken to produce each answer is written at the end of each one. Have a read through each answer and try to see if you can highlight the good and poor areas for the answers. At the end of each Answer I have written some points of note about the way the candidate answered the question.

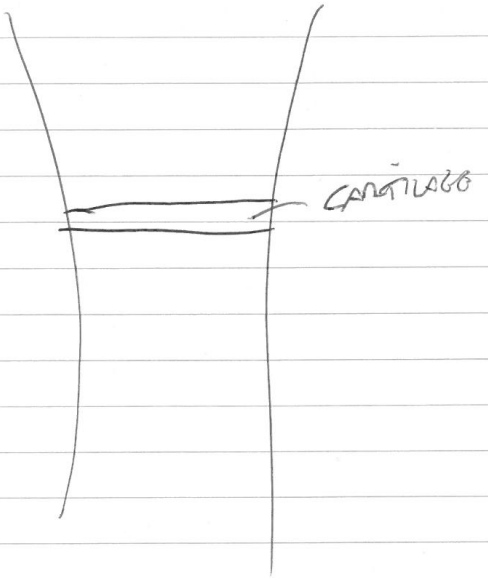
The question being answered for all 3 answers is

What are Epiphyseal cartilages and why are they important to us as farriers? (20marks)

This is a stock Diploma question that comes up often, the wording may change slightly but it's essentially the same question. This is a 20-mark question so care must be taken to fully answer it. It's worth a large amount of marks. It is basically asking two things. The first part is a straight anatomy question and the second part is farrier theory. You need to mentally assign 10 marks for each part.

(1) of (2) FAIL ANSWER.

EPIPHYSEAL CARTILAGES ARE CARTILAGES THAT GROW BONE.



THESE CARTILAGE'S ARE FOUND IN BONES OF YOUNG HORSES AND TURN TO BONE.

THEY ARE IMPORTANT TO US AS FARRIERS BECAUSE THEY ALLOW US TO KNOW THE AGE OF THE HORSE. ONE SHOULD ALWAYS BE TAKEN WITH YOUNGSTERS AS YOU DON'T WANT THEM DEVELOPING PROBLEMS FOR LATER IN LIFE.

IF THERE ARE ANY PROBLEMS WITH THE CARTILAGE FARRIERS CAN CORRECT THE PROBLEMS WITH SPECIAL SHOES. IT COSTS MUCH MONEY TO CORRECT WHEN THE HORSE GETS OLD.

(2)

THE FOLLOWING ARE PROBLEMS WITH THE CATALOGS

- LIMB DEFORMITIES
- BAGS WIDE / BAGS NARROW
- BALLERINA SYNDROME
- TOE IN - TOE - OUT.

~~SOME~~ MOST OF THE ISSUES CAN BE FIXED WITH CORRECTIVE FAMILIES.

Phng

TIME TAKEN
15 MINS

The fail answer.

The answer from this candidate starts with an incorrect statement. *"Epiphyseal cartilages are cartilages that grow bone"* They don't grow bone; they turn to bone *or* they increase the overall length of bone. Be careful with your wording on statements like the one above.

The diagram the candidate draws would be unacceptable for block 1 let alone the diploma exam.

- It's not labelled correctly
- No heading saying what it is showing
- Its anatomically incorrect
- It should be on a separate page
- It shows absolutely nothing and the examiner will not know what the candidate is trying to show.

Underneath the diagram there is another 2 lines of vague writing which tell the examiner almost nothing. This ends the candidate's anatomy section of their answer,

Ask yourself; Of the 10 marks available

- How many, realistically will this candidate be awarded.
- How many would you award?
- Has the candidate demonstrated competency?

Next the candidate moves onto the second part of the question. The Why is it important to us as farriers?

Again this starts badly with more vague statements and some dangerous inaccuracies. The candidate states at one point "it gets much harder to correct when the horse gets old". This will worry the examiners reading it as the candidate is suggesting that it is fixable later in life and they will try and do so. Again this does not display competence. The candidate also says in this section "correct the problem with special shoes "THIS IS A FARRIERY EXAM. The candidates answer needed to at least tell the examiner what shoe, special shoes is not acceptable. The rest of the answer is filled with more inaccuracies and waffle without getting anywhere near the level of answer required for a pass. Remember, a veterinary examiner will also be looking at and making your exam. This means that ⅓ of your theory mark is made up from the vet. Remember to including them as much as possible in your answer.

- Has this candidate demonstrated competency?
- Will the examiner be happy to let this candidate loose?
- Is this a diploma level answer?

1) OF (5)

PASS ANSWER

EPIPHYSEAL CARTILAGES ARE FOUND TYPICALLY IN LONG BONES OF JUVENILE HORSES. THEY ARE RESPONSIBLE FOR A LONG BONE GROWING IN LENGTH. THIS PROCESS IS CALLED ENDOCHONDRAL OSSIFICATION. (SEE FIG 1)

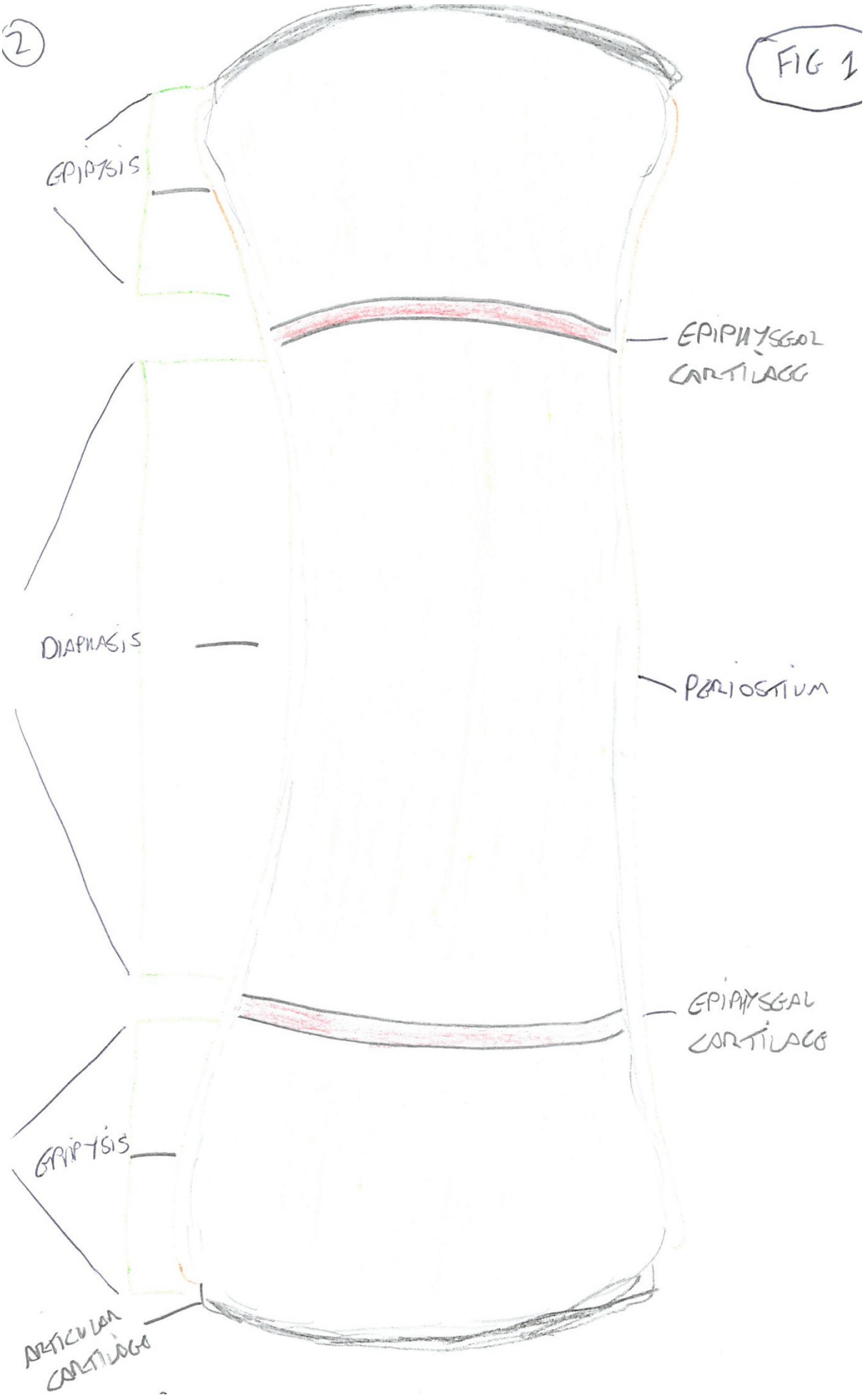
THEY ALLOW THE BONE TO GROW IN LENGTH BY ENLARGING AND EVENTUALLY TURNING TO BONE, THIS PROCESS HAPPENS AFTER BIRTH. THE HORSES BODY WEIGHT PRODUCES PRESSURE, THIS STIMULATES THE CARTILAGES TO ENLARGE AND TURN TO BONE.

EPIPHYSEAL CARTILAGES ARE DIFFERENT TO ARTICULAR CARTILAGES IN MAKE UP AND FUNCTION.

THE BONE WILL ONLY GROW WHILE THE GROWTH PLATE IS OPEN. ONCE IT FULLY OSSIFIES ANY FURTHER GROWTH IS NO LONGER POSSIBLE. GROWTH PLATES HAVE A RAPID GROWTH PERIOD DEPENDING ON ITS POSITION IN THE BODY. AFTER THE RAPID GROWTH PERIOD THE PLATE NARROWS AND THE RATE OF GROWTH IS REDUCED. (FIG 2)

FINALLY THE PLATE IS TURNED INTO BONE AND THE DIAPHYSIS + EPIPHYSIS FUSE TOGETHER.

FIG 1


EPIPHYSIS
EPIPHYSEAL CARTILAGE
DIAPHYSIS
PERIOSTIUM
EPIPHYSEAL CARTILAGE
EPIPHYSIS
ARTICULAR CARTILAGE

3)

CLOSING TIMES OF GROWTH PLATES

GROWTH PLATE	AGE AT CLOSURE	RAPID GROWTH PERIOD
ISTAL RADIUS	2-5 YEARS	0-8 MONTHS
STAL 3rd METACARPAL	1 YEAR	0-3 MONTHS
ISTAL TIBIA	2 YEAR	0-6 MONTHS
OXIMAL PHALANX	6 MONTHS	
AXIMAL MIDDLE PHALANX	6 MONTHS	
STAL 3rd METATARSAL	1 YEAR	0-3 MONTHS

IG 2: SHOWING CLOSING TIMES OF GROWTH PLATES ACCORDING TO NICKLMANS FARRIGHT (1977).

KNOWLEDGE + UNDERSTANDING OF THESE GROWTH PLATES ARE IMPORTANT TO US AS FARRIERS FOR MANY DIFFERENT REASONS.

ANGULAR LIMB DEFORMITY'S

TIMES ARE DEVIATIONS FROM THE SAGITTAL PLANE

VARUS: A LATERAL DEVIATION FROM THE SAGITTAL PLANE.
VALGUS: A MEDIAL DEVIATION FROM THE SAGITTAL PLANE.

THESE DEVIATIONS ARE OFTEN CAUSED BY UN-EVEN GROWTH OF EPIPHYSEAL CARTILAGE'S. THEY ARE USUALLY ACCOMPANIED BY BASE-WIDE AND BASE-NARROW CONFORMATIONS. GROWTH INSIDE THE PLATE IS MORE ON ONE SIDE CAUSING THE LIMB TO DEVIATE EITHER LATERALLY OR MEDIALLY (FIG 3)

(4) LIMB DEVIATIONS

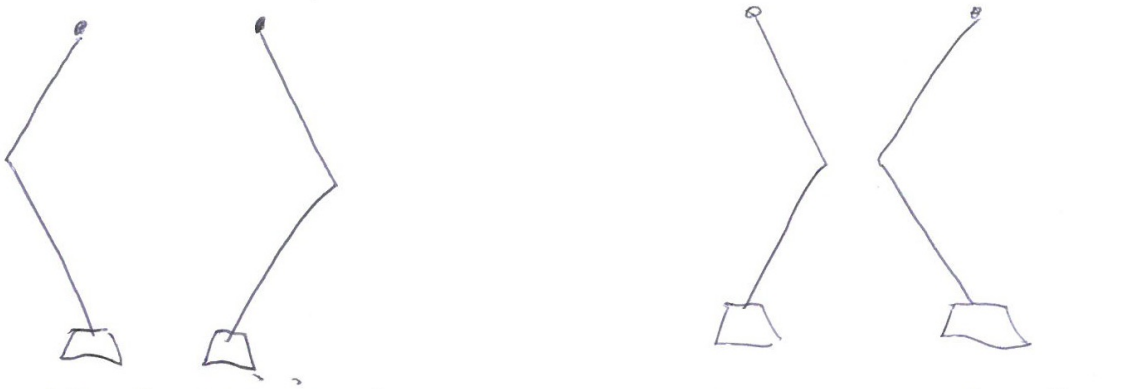
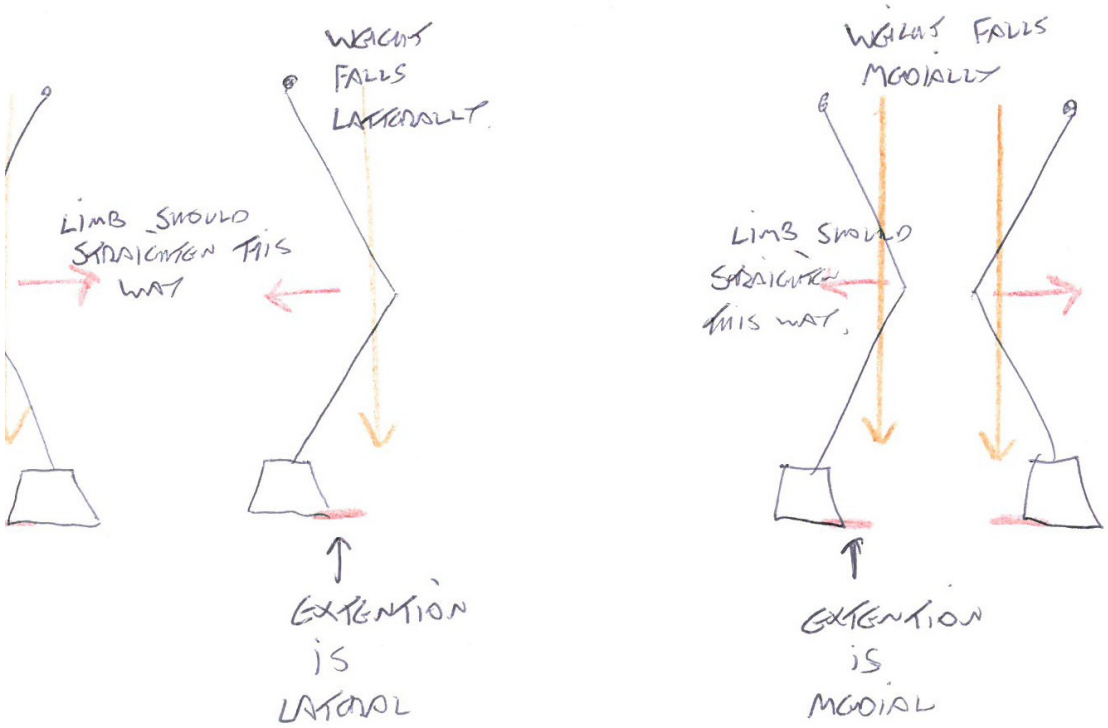


FIG 3. SHOWING VARUS → VALGUS DEVIATIONS OF THE KNEE JOINT



4. SHOWING THE EFFECT AND CORRECTIONS OF BASIC ANGULAR LIMB DEFORMITY

CORRECTIONS OF THE DEVIATIONS CAN ONLY BE ACHIEVED WHILE THEY ARE STILL OPEN AS ONCE THEY HAVE TURNED TO BONE THEY CANNOT BE CORRECTED. KNOWLEDGE OF THIS IS IMPORTANT TO US AS FARRIERS AS IT TELLS US WHAT WE CAN AND CANNOT ACHIEVE WITH ANY CORRECTIVE FARRIERY.

EXTENTION SHOES ARE OFTEN UTILISED BY FARRIERS TO HELP CORRECT ANY DEVIATIONS THEY WORK BY FORCEING THE LIMB (AND GROWTH PLATES) TO BEAR LOAD MORE EQUALLY ACROSS THE WHOLE GROWTH PLATE. (FIG 4)

VETERINARY ASSISTANCE SHOULD ALWAYS BE SOUGHT IN THESE CASES AS SOME MINOR PROBLEMS WILL SELF CORRECT, OVER AGGRESSIVE OR NOT NEEDED CORRECTIVE FARRIERY CAN OFTEN CAUSE THE LIMB TO DEVIATE THE OPPOSITE WAY TO THE ORIGIONAL DEVIATION. THE FARRIER SHOULD ALWAYS STAY IN THEIR SKILL SET AND NEVER ATTEMPT TO CORRECT PROBLEMS THAT ARE NOT SKILLED ENOUGH TO FIX.

FOOT BALANCE

MAINTAINING + CORRECTING GOOD MEDIAL/LAT BALANCE IN THE DEVELOPING FOAL IS ESSENTIAL TO MAINTAIN EQUAL LOAD BEARING, OVERLOADING ONE SIDE MAY POSSIBLY CAUSE A VARUS OR VALGUS DEVIATION.

TIME TAKEN 28 MINS

The pass answer:

The answer starts with a good opening paragraph explaining what epiphyseal cartilages are, good use of words with good and accurate terminology. Words like the ones listed below are good examples of words that should be used to answer a question like this.

- Long bones
- Growing in length
- Juvenile
- Endochondral ossification

Also note the drawings in this answer are numbered and referred to at the relevant point. There can be no confusion from the examiner as to which diagram refers to which bit of the answer.

The candidate then goes onto talking about the cartilage enlarging and growing the bones length, again good use of words and terminology. The candidate also states that articular and epiphyseal cartilage are different in both make up and function. Again this just shows the examiner a higher level of knowledge and thus competence. The next part the candidate explains and demonstrates understanding of rapid growth periods, different closure times of growth plates. All the information in this anatomy section is correct and relevant.

The closure times of growth plates is covered well by this candidate and I want to make a good point here. Notice that the table is referenced to Hickmans Farriery (1977). Hickmans farriery is on the Worshipful Company Of Farriers (WCF) approved reading list for the diploma syllabus. By referencing it (and assuming you have remembered it correctly) the examiners will mark it correct, even if they know it to be incorrect or out of date, things change often in science and anatomy and tables can differ between books. Remember one set of tables and reference them, remember to check they are on the WCF reading list if you are going to reference published literature.

The diagrams in figure 4 are simple diagrams, your diploma is not an art exam although it is worth noting that they do need to be anatomically correct, especially when drawing ligaments and tendons etc. in this case the candidate is showing varus and valgus deviations so the anatomy can be very basic as it's not part of the answer. The diagrams are relevant with the top ones showing what the deviations look like whilst the bottom ones describe the desired effects of extensions.

The last bit of the answer covers corrections to deviations while always giving relevance to why it's important to us as farriers. It's always important to remember what the question is asking. Deep or high level corrective farriery was not asked for directly in the question.

The second to last paragraph is an important one. Talking about veterinary assistance, the dangers of over correction and the need to remain in your skill set are always great to include in answers to questions like this. It shows competence and safety to the examiners.

The very last paragraph about trimming belongs further up the answer, it was a mistake by me and I forgot to put it where I wanted it, by this time I was running out of time, I could and should have written more but time was against me by this point, that said I did get the main points in about good balance and level landing/loading.

Time management for your answers is critical on your written exam, spending longer on certain answers is fine as long as its accounted for, if you go over time on one answer you need to ensure you go under time on another answer. Failing to plan and stick to your timings will result in not enough time to answer the last question. Use the 10 minute reading time at the start of the exam to pick the questions that might require more time and offset them against other questions that you can answer in less time. Make sure your timings work and ensure you stick to them.

OF (8)

MONOURS ANSWER.

EPIPHYSEAL CARTILAGES ARE TYPICALLY FOUND IN LONG BONES. THEY ARE RESPONSIBLE FOR THE LONGITUDINAL GROWTH OF LONG BONES. ~~THEY ARE~~ THEY ARE A TRANSVERSE DISC OF CARTILAGE.

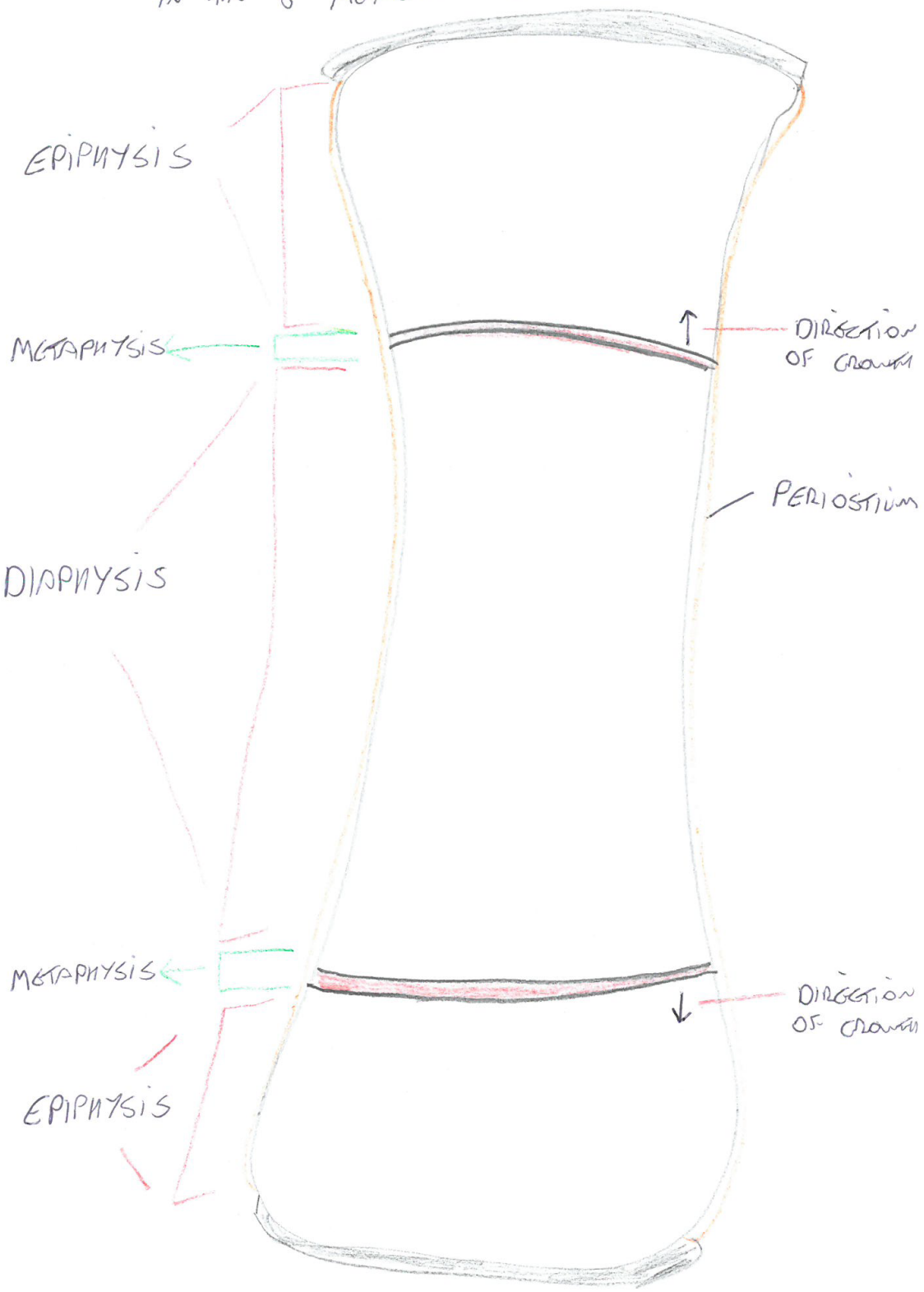
THE PROCESS OF BONE GROWTH IS KNOWN AS OSTEOGENISIS

LONG BONE GROWS IN 2 DISTINCT WAYS

NDOCHONDRAL - A BONE GROWING IN LENGTH.
ER-MEMBRANOUS - A BONE GROWING IN WIDTH + MASS.

EPIPHYSEAL CARTILAGES ARE SMALL CARTLAGE'S FOUND IN-BETWEEN
E DIAPHYSIS + EPIPHYSIS OF LONG BONES IN AN AREA KNOWN
S THE METAPHYSIS. (FIG 1). EPIPHYSEAL CARTILAGE IS MADE UP
OF CELLS CALLED CHONDROCYTES, THESE CELLS ARE THE ONLY
CELLS FOUND IN UN-DEVELOPED EPIPHYSEAL CARTILAGE. AS THE
EPIPHYSEAL CARTILAGE DEVELOPS THESE CHONDROCYTES ARE REPLACED
BY BONE FOLLOWING OSTEO-ACTIVITY FROM BONE CELLS
CALLED OSTEOBLASTS (FIG 2) OSTEOBLASTS ARE BONE PRODUCING
LLS THAT DERIVE FROM MESENMECHIL STEM CELLS. THEY ~~ARE~~
RE FOUND IN ABONDENCE IN THE INNER LAYER OF THE PERIOSTIUM.

FIG 1 : SHOWING THE LOCATION OF THE EPIPHYSEAL CARTILAGE IN THE 3rd METACARPAL BONE



HOW THE PLATE DEVELOPS :-

FIG 2 SHOWS A DEVELOPING GROWTH PLATE. IT CAN BE SEEN AS 5 DISTINCT ZONES HISTOLOGICALLY.

ZONE OF RESTING :- THE CHONDROCYTES IN THIS ZONE ARE EQUALLY SPACED AND FLOATING IN THE GEL MATRIX.

ZONE OF PROLIFERATION :- THE CHONDROCYTES IN THIS ZONE STARTS TO DIVIDE AND ARRANGE THEMSELVES IN THE DIRECTION OF GROWTH. (LONGITUDINALLY) IN THIS CASE.

ZONE OF MATURATION :- THE CHONDROCYTES IN THIS ZONE ENLARGE. THIS ENLARGEMENT IS WHERE THE GROWTH IN LENGTH OF A BONE COMES FROM. THE CHONDROCYTES IN THIS ZONE + THE ZONE OF PROLIFERATION ARE SUBJECT TO A GROWTH HORMONE THAT STIMULATES THEM.

ZONE OF CALCIFICATION :- THE CHONDROCYTES IN THIS ZONE DIE. THEY DIE BECAUSE THEY ARE SO TIGHTLY PACKED THEY CANT TAKE IN NUTRIENTS AND THEY CANT GET RID OF THEIR WASTE. WHEN THEY DIE THEY LEAVE SPACES (GAPS).

ZONE OF OSSIFICATION :- BLOOD ENTERS THE GROWTH PLATE FROM THE DIAPHYSIS, CARRIED IN THE BLOOD ARE PROGENITOR CELLS, (THESE LATER FORM INTO OSTEOBLASTS). THE OSTEOBLASTS EXPLOIT THE GAPS LEFT BY THE CHONDROCYTES AND BEGIN TO BUILD BONE MATRIX.

GROWTH PLATES OSSIFY FROM THE DIAPHYSIS TO THE EPIPHYSIS.

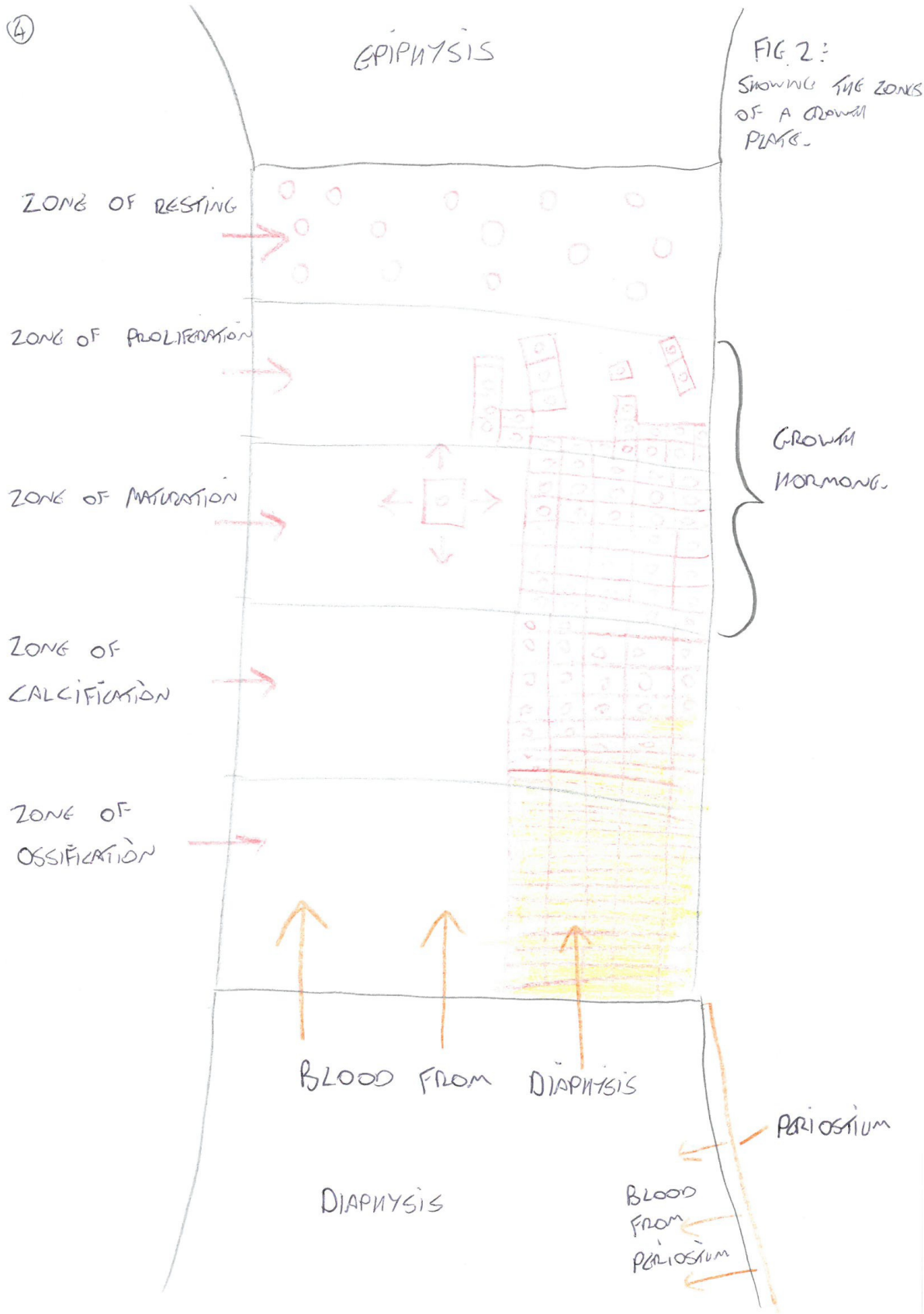


FIG 2:
SHOWING THE ZONES OF A GROWTH PLATE.

THE LONGITUDINAL GROWTH OF BONE ONLY CONTINUES AS LONG AS THE GROWTH PLATE EXISTS, AT FIRST THE PLATE IS WIDE AND ITS GROWTH AFTER BIRTH IS RAPID. LATER THE PLATE NARROWS AND RATE OF GROWTH IS REDUCED. FINALLY THE PLATE IS REPLACED BY BONE AND THE DIAPHYSIS AND EPIPHYSIS FUSE TOGETHER. ALL THAT IS LEFT IS A VERY THIN MICROSCOPIC LINE KNOWN AS THE EPIPHYSEAL LINE. BONES often BREAK ALONG THIS LINE.

ALL GROWTH PLATES HAVE A RAPID GROWTH PERIOD, SET OUT IN THE TABLE BELOW ARE THE CLOSURE TIMES AND RAPID GROWTH PERIODS OF THE DIFFERENT GROWTH PLATES.

GROWTH PLATE	AGE AT CLOSURE	RAPID GROWTH PERIOD
DISTAL RADIUS	2·5 YEARS	0-8 MONTHS
DISTAL 3rd METACARPLE	1 YEAR	0-3 " "
DISTAL TIBIA	2 YEARS	0-6 " "
DISTAL 3rd METATARSAL	1 YEAR	0-3 " "
PROXIMAL PHALANX	6 MONTHS	
PROXIMAL MIDDLE PHALANX	6 MONTHS	

(NICKLMANS FARRIERY 1977)

KNOWLEDGE OF ALL ASPECTS ARE ESSENTIAL FOR ALL FARRIERS. GROWTH PLATES ARE IMPORTANT TO FARRIERS FOR A FEW REASONS. GROWTH PLATES SOMETIMES DEVELOP PROBLEMS LEADING TO CERTAIN CONDITIONS. OUR KNOWLEDGE OF THESE STRUCTURES AND THEIR LIMITS IS VITAL IS A SUCCESSFUL OUTCOME IS ACHIEVABLE WITH ANY CORRECTIVE FARRIERY.

ANGULAR LIMB DEFORMITIES (A.L.D.)

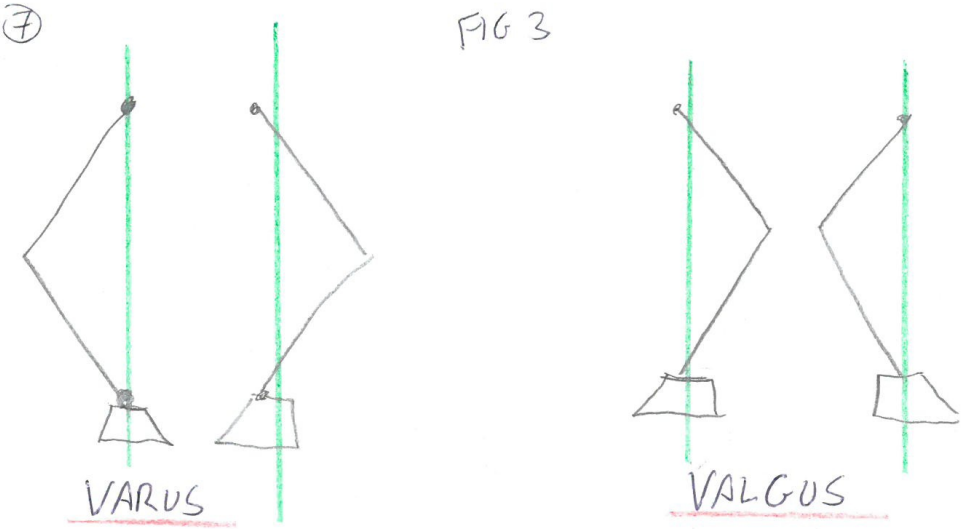
THESE ARE DEVIATIONS FROM THE SAGITTAL PLANE. (FIG 3)

VARUS : A LATERAL DEVIATION FROM THE SAGGITAL PLANE
VALGUS : A MEDIAL " " " " "

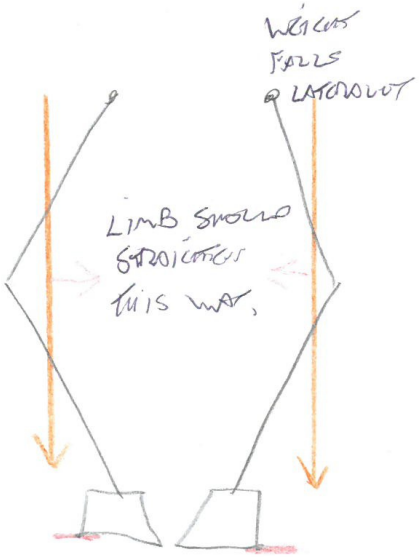
THESE USUALLY DEVELOP DURING THE RAPID GROWTH PERIOD AND ARE CLASSED AS DEVELOPMENT ORTHOPAEDIC DISORDERS (D.O.D.) THERE ARE A FEW CAUSES BUT THE MAIN CAUSE IS POOR CONFORMATION, MORE SPECIFICALLY BASE WIDE OR BASE NARROW. THIS CAUSES COMPRESSION ON ONE SIDE OF THE CARTILAGE, SLOWING GROWTH ON THAT SIDE, THE OPPOSITE SIDE EXPERIENCES LESS COMPRESSION ALLOWING IT TO GROW MORE NORMALLY. THIS CAUSES A VARUS OR VALGUS DEFORMITY TO FORM. THESE DEFORMITY'S OFTEN HAVE A NEGATIVE EFFECT ON HOOF CAPSULE MORPHOLOGY.

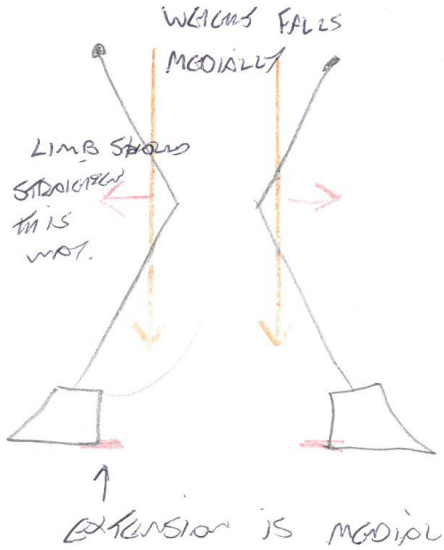
FOOT BALANCE : CORRECTING OR MAINTAINING GOOD FOOT BALANCE IN ANY HORSE IS VITAL BUT ARGUABLY MORE IMPORTANT IN THE ~~YOUNG~~ DEVELOPING FOAL. GOOD, NORMAL FOOT BALANCE WILL ALLOW THE FOOT TO LAND + LOAD LEVEL, REDUCING GREATLY THE RISK OF EPIPHYSEAL CARTILAGE PROBLEMS. ONCE THE FOAL HAS DEVELOPED AN A.L.D. IT USUALLY AFFECTS THE HOOF CAPSULE. A VARUS DEVIATION USUALLY CAUSES AN UPRIGHT LATERAL HOOF WALL AND A FLARED OR SLOPING MEDIAL WALL WITH A VALGUS DEVIATION HAVING THE TOTALLY OPPOSITE EFFECT WITH THE MEDIAL WALL BEING UPRIGHT AND LATERAL FLARING.

FIG 3



SHOWING DEVIATIONS FROM THE SAGITTAL PLANE (GREEN LINE IS SAGITTAL PLANE)





↑ EXTENSION IS MEDIAL

FLEXURAL DEFORMITY : A GROWTH PLATE PROBLEM CAN CAUSE A FLEXURAL DEFORMITY BUT THIS IS LESS COMMON. BALLERINA SYNDROME OR A CLUB FOOT CAN RESULT. EPIPHYSITIS (ALSO KNOWN AS PHYSITIS) IS AN ENLARGEMENT OF A GROWTH PLATE USUALLY DURING THE RAPID GROWTH PERIOD. THIS RAPID GROWTH ACCOMPANIED BY ~~[illegible]~~ ABNORMAL ENLARGEMENT ~~can~~ CAN CAUSE TIGHTENING OF THE FLEXOR UNIT LEADING TO CLUB FOOT, OR WORSE THINGS LIKE BALLERINA SYNDROME. EPIPHYSITIS IS ALSO CLASSED AS D.O.D. A FLEXURAL DEFORMITY IS A LIMB THAT DEVIATES FROM ITS NORMAL VERTICAL ALIGNMENT IN THE SAGITTAL PLANE.

NOTE

SOME OF THESE CONDITIONS, ESPECIALLY A.L.D.'s CAN AUTO-CORRECT. VETERINARY ASSISTANCE SHOULD ALWAYS BE SOUGHT BEFORE ANY CORRECTIVE FARRIERY IS CARRIED OUT. IT IS ALSO IMPORTANT FOR ANY FARRIER TO ~~start~~ IN HIS/HER SKILL SET.

TIME TAKEN

37 MINS

The honours answer

This answer is very similar to the pass answer. It just has a slightly deeper level of knowledge and it is full of extra depth threaded throughout the answer. Points to note on this answer

- The core answer and information is always written and covered first before all the extra honours bits are included.
- Depth of knowledge is evident and above that of a good pass answer.
- The time was 37 minutes, this answer took longer than the allotted time, the candidate would need to make up time on another answer (the exam usually has at least 1 question can comfortably take less than 30mins to answer).

The opening paragraph was very similar to the pass answer but the terminology was slightly better. A transverse disc of cartilage and longitudinal growth just display a slightly higher level of understanding, the same applies to Osteogenisis and the candidate including inter-membranous ossification into the answer.

The candidate then starts getting into cell level stuff about Chondrocytes and the make-up of the growth plates, followed by a comprehensive drawing and write up about what actually happens inside a growth plate. All of that info is totally irrelevant if you cannot first demonstrate competence by answering the question well and accurately, this is a big danger area for the potential 'A' student. DO NOT get too technical too soon. The question first needs answering, do not forget the basics first, I can't stress this enough, don't go chasing honours and totally miss the question altogether.

The farrier theory side of the answer is also very similar to the pass answer. It just has a slightly higher level of answer. Defining Valgus and Varus is a good thing to do. Mentioning Developmental Orthopaedic Disorder (DOD) compression of one side of the cartilage and poor hoof capsule morphology again just demonstrate a good command of the subject.

Again, all relevant trimming and veterinary assistance information is in the answer as well as a mention of flexural deformities (including a definition of flexural deformities) Epiphysitis was included and the possible consequences of it.

37 minutes to answer the question was something the candidate was aware of. This question is a difficult to write out in 30 mins (especially with the growth plate cell level stuff in there) the candidate made a conscious decision to go over time on this answer but would have made the time back up again on another question. Please don't ever go over time chasing an extra 1 or 2 marks on a question and leave yourself no time to answer the final question because that one is worth 20 marks. Think and plan, especially if you are pushing for an 'A' grade.