Name: _____ Seat #: _____ 30 points total

*This section of the exam contains 15 short answer type questions (30 points). Read the directions and questions carefully. All answers should be short, legible and spell-checked. Answers that cannot be read will be marked wrong. Responses containing the correct answer surrounded by numerous non-correct answers will also be marked wrong.*

Dr. Iggy has treatment planned a gold crown on tooth # 30. While reviewing the chart he notes that tooth # 30 had a large pin amalgam buildup replacing the ML and DL cusps done 3 years ago. He did not place the buildup and is concerned about the pin location. The tooth is not symptomatic and radiographs show a healthy apex with no evidence of pulpal or periodontal perforation. Why should Dr. Iggy be concerned about the pin placement if he is planning to prepare a gold crown?

(1) Pins placed too close to the external surface of the tooth or pins lacking sufficient build-up material on the occlusal surface may be exposed or removed during axial and occlusal preparation resulting in compromised retention of the buildup.

Dr. Iggy begins with occlusal reduction. Dr. Iggy cannot accurately determine if he has adequately reduced the inner inclines of the lingual cusps. What technique can Dr. Iggy do to determine if he has adequate occlusal reduction?

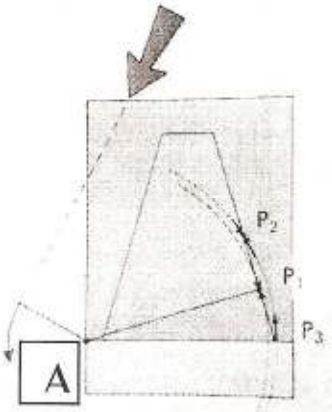
(2) Have the patient bite on softened baseplate wax . Hold the wax up to the light and observe the remaining thickness of the wax looking for thin areas. Can use this technique with the provisional looking for thin areas on the occlusal but using the provisional is not as accurate. Can use a preop overimpression which has been cut in cross section and overlayed onto the prepared to help visualize reduction. (Shillingburg Chapter 10)

What bur should Dr. Iggy use for the occlusal reduction? Justify your answer. (3) cylinder/ shoulder preferred because in produces uniform reduction between the cusp tip and fossa. Round end tapered is also acceptable.

Dr. Iggy completes the occlusal reduction and begins to place the functional bevel (second plane) What is the required reduction for the functional second plane? (4) 1.5 mm

Failure to provide an adequate second plane (functional cusp bevel) will have what effect on the final casting?
(5) Widened occlusal table resulting in occlusion problems. Also errors in casting thickness: too thick will result in hyper occlusion; occlusal adjustment to attain proper thickness will result in a thin casting and compromised structural integrity

Dr. Iggy completes the axial reduction and is worried that he may be over-tapered. He remembers a diagram from a textbook in dental school showing how force applied at an oblique angle can unseat a crown. (See diagram to the right)




The point on the margin (A) closest to the line of action is called the fulcrum point or center of rotation. If a line drawn from the center of rotation perpendicular to the cement film on the opposite wall of the prep, the point where this line intercepts the cement film is called the tangent point.

At $P_1$ (tangent point) the arc of rotation is tangent to the surface of the preparation and the cement film is subject only to (6) shear forces.

Apical to $P_1$ (area of $P_3$), the cement film is subject to
(7) tension forces

Occlusal to $p_1$ (area of $P_2$), the cement film is subject to
(8) compression forces

Of the three areas shown (P1, P2, P3), which area provides the most resistance to unseating a casting by oblique forces (prevents tipping of a restoration around the axis)? (9) P2

Dr. Iggy finishes the preparation and begins the provisional fabrication. He chooses to do a block carving and after the initial squash and removal of excess acrylic he prepares for the reline. Dr. Iggy removes acrylic from the inside of the provisional (reams it out) to make room for the reline acrylic. When does Dr. Iggy know he has removed enough acrylic from the inside of the provisional and is ready for the reline?

(10) The occlusion is the same with the provisional in as it is with it out / adjacent teeth are in contact when the provisional is seated. Many answers talked about the "provisional seating completely". I did not accept this as a full answer if it did not include some mention of the occlusion.

Before he does the reline Dr. Iggy notices he no longer has mesial and distal contact. Describe **two** methods Dr. Iggy can use to re-establish the contact points.

(11) He can create vent holes in the provisional in the contact areas before the reline and allow the reline acrylic to re-establish contact. He can use the paint-on technique

Dr. Iggy completes the provisional and makes an acceptable impression which he sends to the lab for crown fabrication. He cements the provisional and dismisses the patient. Two days later the patient calls the office complaining of sensitivity on tooth #30. The patient says the pain occurs during chewing and when she eats "sweets". Dr. Iggy knows the tooth was asymptomatic before the crown preparation (no pulpitis) and his crown prep was textbook perfect regarding amounts of reduction. Give two possible reasons to explain the patient's sensitivity.

(12) hyper occlusion open margins

At the crown seating appointment Dr. Iggy notices the crown is not seating completely. The crown margins are uniformly open and the occlusion is high. He panics and forgets the sequence of operations he should follow when seating a crown. Describe the correct sequence of operations and what criteria you would be looking for when initially seating a gold crown. I'll walk you through it and you describe what you should be doing and what you are looking for.

The first thing Dr. Iggy should do is examine what surface of the crown? (13) entire internal surface

What is he looking for and how would he correct the problem if he finds one?

(14) bubbles. Use a small round bur on a **high** speed to remove the bubbles. He can also use occlude to identify areas on the internal surface of the crown that may be binding and preventing seating. Many students gave me a description of what to do when finishing and polishing a casting in the lab. The question is asking what to do chair side when the crown does not seat. Many students gave the wrong order of operations (contacts before internal surface is wrong).

Problems found in the step described above have been corrected and the crown seats further but it is still not fully seating. What surface/area of the crown should Dr. Iggy examine next? What is the best way to correct the problem found above? Be specific.

(15) heavy contact points/areas prevent complete seating of the crown. Spray occlude on the contacts and seat into the patient's mouth to identify the heavy area of proximal contact. Adjust using carbide or abrasive stones.
Many answers stated that Dr. Iggy "would carefully adjust the contacts" but did not give specifics. I was looking for a reference to occlude or some other indicating medium on the contact area to aid in determining where the contacts are heavy. Failure to use some type of indicating medium would require the dentist to "guess" at where the contact was heavy.