



**School of Dentistry**  
Department of Restorative Dentistry

$$\begin{aligned} & \text{Handwritten calculations: } -12, (12)(16) = 19.2 \text{ ps}, \frac{19.2}{63} = 0.3, 100 - 19.2 = 80.8, \text{ and } 80.8 \text{ circled.} \\ & \text{Note: } 100 - 19.2 = 80.8 \end{aligned}$$

**not corrected**

RESTORATIVE DENTISTRY V (D553)

**Final Examination**

December 16, 2005

PROPERTY of XI PSI PHI

TEST CODE 03

**INSTRUCTIONS**

- Verify that you have an examination booklet with six pages and sixty-three questions.
  - Write your name on the computer answer sheet, as well as a nine digit personal identification number of your choosing in the field labeled "social security number", and blacken the appropriate circles with a #2 pencil.
- Note: Test scores will be posted by PINs.*
- Sign and date the back of the computer answer sheet.
  - **IMPORTANT!** Write the Test Code Number (above) on the computer answer sheet in the "Test Code" field under "Optional Codes", and blacken the appropriate circles.
  - For each question answered, blacken the appropriate circle on the computer answer sheet corresponding to the letter of your choice.
  - Students are not permitted to ask questions of the proctors during the examination. Do your best to answer each question with the information provided.
  - When you have completed the examination, turn in your computer answer sheet. You may keep the question booklet.

*This exam consists five groups of questions that are based on individual patient profiles. For each case presented, the first set of true/false type questions tests factual knowledge relevant to the patient profile. The second set of multiple-choice questions tests reasoning skills related to decision-making for the case. Every question has a value of one point.*

# Patient Profile #1

29-year-old male in excellent overall health

Missing teeth: none

S: broke upper left tooth while chewing ice; moderate throbbing pain that requires analgesic to control

no existing restorations; Bu cusp missing from tooth #12, fracture of the facial surface extends to free gingival margin, pulp exposed; few pocket measurements of 4-5 mm, mainly molar regions; Angle Class I occlusion with bilateral canine guidance, no obvious attrition

A: fractured tooth and irreversible pulpitis #12; localized mild chronic periodontitis

P: RCT #12; scaling and root planing; post/core and PFM crown #12

For each of the following questions, indicate whether the statement is true (A) or false (B).

1. The zinc phosphate, polycarboxylate and traditional glass ionomer cements all may be described as setting by an acid-base reaction.
2. In the process of making a cast post and core for tooth #12, the remaining tooth structure should be prepared for crown coverage prior to making the burnout pattern.
3. During the fabrication of the metal substructure for PFM crown #12 using the lost wax method, most of the negative dimensional change (shrinkage) would occur when the impression goes from mouth temperature to room temperature. casting
4. Considering all the steps in the process of fabricating the PFM crown for tooth #12, the first important quality control evaluation would occur when the raw metal casting is inspected on the stone die.
5. Of all the final luting cements that could be used to install the PFM crown, the one class that has more applications in restorative dentistry than any other (and therefore is most versatile) is the resin cements. ZnPO4
6. The lost-wax method is so precise that it is possible to fabricate a metal substructure for the PFM crown with a marginal discrepancy (gap) so small as to be undetectable with the naked eye (less than 50 microns).
7. When considering the dental cement "family tree", a component that the polycarboxylate and glass ionomer cements have in common is fluorosilicate glass.
8. If the patient's natural teeth exhibit shades in the VITA A family, their hue may correctly be described as "reddish-grey". red-brown

For each of the following questions, choose one of these responses:

- The STATEMENT is true and the REASON is true  
● The STATEMENT is true, but the REASON is false  
C= The STATEMENT is false

PROPERTY of XI PSI PHI

9. STATEMENT: Before a separating material and molten wax are applied to the stone die (tooth #12), the die surface should be treated with a flowable hard-setting film to within 1-1.5 mm of the crown preparation margins.  
REASON: Die relief produces a minute space for luting cement between the intaglio surface of the casting and the prepared tooth surface, which permits full seating of the crown during final installation.
10. STATEMENT: If full-arch casts are mounted on a semi-adjustable articulator in order to fabricate the crown for tooth #12, they may be mounted by "hand articulation". T  
REASON: The two requirements for mounting casts by hand articulation are a tripod of vertical support and horizontal stability, both of which exist in this case. T
11. STATEMENT: When choosing the porcelain shades for crown #12, it would be useful to drape the patient's neck with a soft medium blue napkin.  
REASON: Gazing occasionally at a blue background improves the visual response to the complementary orange/yellow tones typically found in teeth.
12. STATEMENT: Zinc phosphate cement would be useful for the final installation of the PFM crown. T  
REASON: Zinc phosphate produces a significant adhesive bond between metal and dentin. F
13. STATEMENT: Prior to preparing tooth #12 for a crown, the gingival unit must be examined and the depth of the crevice must be measured.  
REASON: The location and design of the facial margin of the crown would be determined, in part, by the architecture of the gingival tissue in that area.
14. STATEMENT: Choosing a self-adhesive resin cement for crown #12 instead of a traditional composite resin cement would simplify and reduce the technique sensitivity of the final installation process.  
REASON: The new self-adhesive resin cements have eliminated the etch-rinse-blot step and do not require the application of a separate bonding agent.

**Patient Profile #2**

57-year-old insulin-dependant male

Missing teeth: #1, 2, 3, 4, 6, 12, 13, 14, 16, 17, 18, 19, 30, 31, 32

S: broken upper removable partial denture (unwearable); loose upper front teeth

P: 6-8 mm periodontal pockets around remaining maxillary anterior teeth with Class 3 mobility; #15 contacts mandibular residual ridge in MIP; large fractured amalgam restoration #20

A: severe chronic periodontitis of the maxilla; mild chronic periodontitis of the mandible; defective maxillary prosthesis

P: scaling and root planing; core build-up and PFM crown #20; new removable prostheses

For each of the following questions, indicate whether the statement is true (A) or false (B).

1. A surgical template would facilitate the delivery of an immediate maxillary complete denture by guiding the proper contouring of the anterior ridge following the removal of the natural teeth.
2. If all the remaining natural teeth were extracted, post-surgical bone remodeling would be complete and a stable ridge contour would be achieved in an average of 2-3 months. *6-12 mos*
3. When fabricating a mandibular RPD, the primary reason for making a functional impression of the posterior ridges for the altered cast procedure would be to reduce the risk of occlusal interferences in the completed prosthesis.
4. If the "combination" impression method were used during the fabrication of an immediate maxillary complete denture, a stock metal tray could be used with alginate for the second impression. *PS for ridges, alg for teeth*
5. If the patient were provided only a new maxillary removable prosthesis (no mandibular denture), the mandibular residual ridge would remain stable for an extended and predictable period of time.

For each of the following questions, choose one of these responses:

A= The STATEMENT is true and the REASON is true

B= The STATEMENT is true, but the REASON is false

C= The STATEMENT is false

PROPERTY of XI PSI PHI

20. STATEMENT: If a conventional mandibular RPD is made to replace the missing mandibular posterior teeth, irreversible hydrocolloid (alginate) would be an acceptable material to make an impression for the fabrication of the cast metal framework.  
REASON: Alginate is dimensionally stable due to its excellent resistance to syneresis and imbibition.
21. STATEMENT: If a mandibular RPD were made for this patient, he would benefit from being recalled for examination at shorter intervals than other patients who do not have prostheses. T  
REASON: The findings of available clinical studies suggest that wearing conventional RPDs is associated with an increased risk of developing caries lesions and losing residual ridge bone. T
22. STATEMENT: Even if teeth #7-11 and #15 were extracted, the best prosthodontic option for the maxillary arch would be to retain tooth #5 as an abutment for a conventional RPD. F  
REASON: Surveys of complete denture wearers typically reveal a very low level of satisfaction with their maxillary prostheses. F
23. STATEMENT: A reasonable treatment option would be to fabricate a maxillary complete denture and to maintain all of the remaining mandibular teeth without replacing the missing molars. F  
REASON: The professional consensus reported in the literature is that patients with about 20 teeth (natural and prosthetic), including several pairs of occluding posterior teeth, usually report satisfactory chewing ability and trouble-free eating.
24. STATEMENT: It can be predicted with a very high level of confidence that this patient would faithfully wear a mandibular RPD if it were fabricated according to accepted technical standards. F  
REASON: Studies of masticatory ability reveal that people who are missing their molars usually complain that they have a great deal of trouble chewing their food.
25. STATEMENT: If the patient requests an immediate maxillary complete denture, a sensible option would be to extract teeth #5 and #15 immediately, and then extract teeth #s 7, 8, 9, 10, and 11 when the denture is inserted.  
REASON: Removing the posterior teeth would permit a wax try-in of the posterior denture tooth set-up to confirm the accuracy of the initial centric relation record.
- STATEMENT: If a conventional clasp-retained mandibular RPD were planned for this patient, a "triple-tray" impression procedure would not be a good option for creating a master cast and die for tooth #20. T  
REASON: A wax pattern for an abutment crown cannot be surveyed correctly on a stone cast made from a quadrant impression.

**Patient Profile #3**

72-year-old female, totally edentulous

• Loose dentures with worn and broken teeth, 20+ years old

• Atrophic mandibular ridge; diffuse red papillary lesion of the hard palate

A: mild inflammatory papillary hyperplasia; defective complete prostheses

P: new complete dentures

For each of the following five questions, indicate whether the statement is true (A) or false (B).

- 1 27. When evaluating the trial wax dentures, the vertical dimension of occlusion should be verified by observing the closest speaking space when the patient produces sibilant sounds. T
- 3 28. The primary reason for observing "F" and "V" sounds during the complete denture wax try-in visit would be to verify the initial centric relation record.
- 1 29. Research that attempts to gauge acceptance of treatment outcomes indicates that elderly experienced denture wearers (such as this patient) are more likely to accept functional limitations from their dental prostheses compared to younger first-time denture wearers.
- 3 30. By definition, closest speaking space is synonymous with freeway space.
- 1 31. If the patient exhibits a "sore spot" (small traumatic ulcer) in the area of a border soon after insertion of the new dentures, it is logical to assume the border is overextended and must be shortened.
- 3 32. If bilateral bony undercuts are observed in the area of the tuberosities, the denture base should extend into the undercuts in order to maximize the retention of the prosthesis.
- 1 33. The etiology of residual ridge resorption is multifactorial, but little is known about which factors are dominant.

For each of the following five questions, choose one of these responses:

- A= The STATEMENT is true and the REASON is true  
• The STATEMENT is true, but the REASON is false  
• The STATEMENT is false

PROPERTY of KPSI

- A 34. STATEMENT: When making a new centric relation record with softened Aluwax to verify the mounting of trial wax dentures on the articulator, the patient should stop slightly short of full closure. T  
REASON: Bringing the teeth into full contact may cause the mandible to deviate from its normal path of closure if the centric relation occlusion of the trial dentures is not correct. T
35. STATEMENT: The posterior border of the new maxillary complete denture should end at the junction of the hard and soft palates. F  
REASON: Retention of the complete denture is dependent on a firm peripheral seal that prevents air leakage under the denture base.
36. STATEMENT: Prior to making preliminary impressions for new dentures, a series of resilient liners may be used in the existing maxillary denture. F  
REASON: Pre-prosthetic tissue conditioning may be effective in eliminating the inflammatory disease and returning the maxillary denture-bearing mucosa to a healthy state.
37. STATEMENT: Prior to border molding, the peripheral flanges of the custom edentulous impression trays must be assessed in the mouth by activating the surrounding musculature and inspecting for proper relief. T  
REASON: Casts fabricated from preliminary alginate impressions are usually underextended in the vestibular folds. X
38. STATEMENT: When modifying the maxillary master cast for the posterior palatal seal, the deepest penetration (2 mm) will be made immediately posterior to the tuberosities.  
REASON: The most depressible soft tissue along the posterior border of the maxillary denture is located in the hamular notches.
39. STATEMENT: If properly designed, the new dentures should provide a vertical dimension of occlusion that is equal to the vertical dimension at rest.  
REASON: Periods of mandibular relaxation remove the occlusal load from the residual ridges and reduce the potential for bone resorption.
40. STATEMENT: The inflammatory papillary hyperplasia observed in the palatal area must be resolved before beginning the fabrication of new dentures.  
REASON: Inflammatory hyperplasia is a very painful condition, and it would persist under the new denture.

12

**Patient Profile #4**

44-year-old male, hypertension controlled by medication; Missing teeth: #1, 4, 15, 16, 17, 31, 32

S: would like to replace missing upper right tooth

C: numerous posterior amalgam and composite restorations, many large, some failing; several new caries lesions, including recurrent; few periodontal pocket measurements of 4-5 mm, mainly molar regions; slight-moderate wear of all cusps and incisal edges

A: dental caries; defective restorations; missing teeth; localized mild chronic periodontitis; bruxism

P: scaling and root planing; replace several amalgam/composite restorations; 3-unit PFM bridge #3-5; core build-ups and crowns, teeth #7 and 30

For each of the following questions, indicate whether the statement is true (A) or false (B).

41. During the fabrication of the fixed prosthesis #3-5, if posterior segmental occlusal registrations were to be used to help mount the mandibular cast against the maxillary master cast on an articulator, a rigid-setting material (e.g., Duralay, Blu-Mousse) would be indicated in the right posterior area.

42. One benefit of placing the margins of abutment crowns #3 and #5 at least 1 mm into the gingival crevice would be a significant reduction in the risk of secondary caries.

43. A potential source of error in the solder indexing process for the metal substructure of a 3-unit fixed prosthesis is distortion from the setting expansion of the Duralay material.

44. When considering the core build-up options for teeth #7 and #30 (either direct or indirect), it is more likely that a cast post and core would be indicated for #7.

45. When preparing the 2-piece metal substructure for a soldered connector (fixed prosthesis #3-5), one should create two opposing flattened surfaces that are separated, prior to indexing, by a narrow uniform gap.

46. The optimal occluso-gingival thickness of a solder joint connecting two sections of the fixed partial denture substructure is about 2.0 mm.

For each of the following questions, choose one of these responses:

A= The STATEMENT is true and the REASON is true

B= The STATEMENT is true, but the REASON is false

C= The STATEMENT is false

47. STATEMENT: It would be medically and ethically appropriate to delay prosthodontic treatment for this patient until disease prevention measures are instituted. T

REASON: The patient exhibits evidence of high caries risk, which means the longevity of the new prosthesis, as well as the other restorations, could be adversely affected. T

48. STATEMENT: A metal collar at the margins of each bridge abutment crown would contribute to the durability of the prosthesis by stiffening the substructure. F

REASON: Flexure of a metal substructure would lead to porcelain fracture due to the high modulus of elasticity of ceramic materials.

49. STATEMENT: A PFM fixed prosthesis with static occlusal contacts on metal would have some significant benefits, and this option must be discussed with the patient.

REASON: The patient's parafunctional habit may increase the risk of attrition of the opposing teeth if porcelain occlusal surfaces were used.

50. STATEMENT: When using the VITA guide to determine porcelain shades for the fixed prosthesis #3-5, one should choose the predominant hue by studying the portions of the neighboring natural teeth nearest to the gingiva. T

REASON: Natural teeth typically exhibit the lowest chroma and highest value in the cervical third. F

51. STATEMENT: If full-arch casts were mounted on a semi-adjustable articulator to fabricate the fixed prosthesis from #3 to #5, they could be mounted in MIP by "hand articulation".

REASON: A tripod of stable centric contacts exists in this case.

52. STATEMENT: If abutment crown #3 seats accurately in the patient's mouth during the initial metal try-in, but crown #5 does not, the best option is to make a new impression that captures both abutments and fabricate a completely new 3-unit metal substructure.

REASON: It would be impossible to realign the abutment crowns on a single master cast if only crown #5 is re-made.

PROPERTY of XI PSI PHI

**Patient Profile #5**

18-year-old female resident of Philadelphia

Missing teeth: mandibular first molars

S: complains of a painful tooth upper left area, hasn't seen a dentist since #30 was extracted 2 years ago

C: few posterior amalgam and anterior composite restorations; many primary and recurrent caries lesions,

Xs I, II, III and V, E1 to D3 (tooth #13); CRT/bacteria Mutans Strep = 500,000 cfu/ml saliva

A: reversible pulpitis #13; generalized gingivitis; dental caries

P: prophylaxis; direct and indirect restorations; long-term preventive management

For each of the following questions, indicate whether the statement is true (A) or false (B).

53. If a total-etch adhesive system were used according to the manufacturer's instructions in the restoration of her carious teeth, a collagen-resin hybrid layer would be produced that would contribute significantly to the dentin bond.

54. The CRT/bacteria value is consistent with a diagnosis of high caries risk.

55. The most appropriate treatment option for the pulp disease affecting tooth #13 is root canal therapy.

56. Since the patient's permanent dentition is fully developed, she would experience neither an appreciable benefit nor an appreciable risk from fluoride in drinking water.

57. Elimination of the active caries lesions by restoring the affected teeth will lower her caries risk to a safe level.

For each of the following questions, choose one of these responses:

A= The STATEMENT is true and the REASON is true

B= The STATEMENT is true, but the REASON is false

C= The STATEMENT is false

58. STATEMENT: If the caries lesion in tooth #13 has progressed to within 1.0 mm of the alveolar crest, crown-lengthening surgery should be considered.

REASON: Margins of restorations placed within the biologic width act as foreign bodies that prevent normal healing of the gingival attachment.

59. STATEMENT: This patient may experience an oral health benefit from a 2-3 week course of chlorhexidine gluconate mouthrinse followed by extended use of xylitol gum.

REASON: The growth and viability of Mutans streptococci are inhibited by chlorhexidine and xylitol.

60. STATEMENT: All teeth with detectable E2 caries lesions of the proximal surfaces of the posterior teeth should receive restorations.

REASON: The probability of surface cavitation of E2 lesions is nearly 50%.

61. STATEMENT: Proximal caries lesions that are *not* cavitated should be managed medically, not surgically.

REASON: For many dental patients a minimally invasive treatment approach reduces morbidity (loss of form, function, comfort, etc.) over a lifetime.

62. STATEMENT: The best treatment for tooth #13 is to excavate the caries lesion down to sound dentin prior to restoring with a resin-modified glass ionomer liner and amalgam or composite resin.

REASON: The findings of a 10-year clinical trial (Mertz-Fairhurst and others) clearly prove that residual caries lesions under sealed restorations remain active and continue to progress.

63. STATEMENT: My New Year's resolution is to lose weight and buy (and faithfully read) the Restorative Dentistry VI course pack.

REASON: When it comes to my body and mind... no pain, no gain!

PROPERTY of XI PSI PHI

BEST WISHES FOR A RESTFUL HOLIDAY