

PRACTICE EXAM 7: CERTIFIED DENTAL TECHNICIAN COMPREHENSIVE SIMULATION (160 QUESTIONS)

This practice exam contains 160 multiple-choice questions. Allow up to 2 hours and 45 minutes, matching the current NBC Comprehensive written-examination time limit. Choose the single best answer for each question. NBC states that minimum passing scores are subject to change and are communicated to candidates; use this simulation for practice and review rather than as an official score prediction.

1. A technician discovers that a case record lists one alloy, but the production traveler lists another. What is the best next step?

- A. Choose whichever alloy is in stock
- B. Complete the case and document it afterward
- C. Use the alloy on the traveler without checking
- D. Stop and resolve the discrepancy before fabrication

2. A laboratory is preparing a training presentation that includes real case photographs. Which practice best protects patient privacy?

- A. Email the complete case file to all attendees
- B. Remove unnecessary identifiers and restrict the information used
- C. Display the full prescription for context
- D. Include the patient name if staff know it

3. Why should a dental laboratory maintain material lot numbers with completed case records?

- A. Trace cases linked to a problem batch
- B. They determine the patient shade automatically
- C. They replace the need for a prescription
- D. They prove the restoration needed no adjustment

4. A prescription specifies a material that is incompatible with the requested design. What should the technician do?

- A. Redesign the restoration without approval
- B. Proceed exactly as written despite incompatibility
- C. Contact the prescribing dentist and document the clarification
- D. Substitute a preferred material silently

5. Which document most directly communicates the authorized patient-specific laboratory work?

- A. The technician schedule
- B. The laboratory price list
- C. A manufacturer advertisement
- D. The dentist's work authorization or prescription

6. A technician needs hazard information for a newly introduced laboratory chemical. What resource should be immediately available in the work area?

- A. The product Safety Data Sheet
- B. The patient appointment calendar
- C. The shade-tab inventory sheet
- D. The laboratory shipping manifest

7. If a laboratory procedure is prohibited by the dental practice act in the laboratory's state, what should guide the technician?

- A. A vendor's instructions alone
- B. The applicable state scope-of-practice requirements
- C. The laboratory's usual custom
- D. A neighboring state's rules

8. During a right lateral excursion with canine guidance, which contact is expected to separate the posterior teeth?

- A. All posterior teeth bilaterally
- B. Left posterior molars only
- C. Right maxillary and mandibular canines
- D. Both central incisors only

9. Which feature is characteristic of a maxillary first molar?

- A. An oblique ridge connecting major cuspal areas
- B. A single central cusp only
- C. A five-cusp Y-shaped groove pattern
- D. A completely flat occlusal table

10. Which permanent tooth most commonly presents three roots?

- A. Maxillary first premolar
- B. Mandibular canine
- C. Maxillary first molar
- D. Mandibular first molar

11. A prescription identifies tooth 19 using Universal notation. Which tooth should the technician locate on the cast?

- A. Maxillary right first molar
- B. Mandibular left first molar
- C. Maxillary left first molar
- D. Mandibular right first molar

12. A digital case is labeled FDI 36. Which permanent tooth does that designation identify?

- A. Maxillary right first molar
- B. Mandibular right first molar
- C. Maxillary left first molar
- D. Mandibular left first molar

13. Which muscle primarily protrudes the mandible when the right and left sides contract together?

- A. Masseter
- B. Lateral pterygoid
- C. Orbicularis oris
- D. Temporalis

14. Which muscle contributes to mandibular elevation and has fibers on the medial surface of the ramus?

- A. Platysma
- B. Buccinator
- C. Mentalis
- D. Medial pterygoid

15. Which mandibular landmark may limit lingual flange extension in the posterior region when it is prominent?

- A. Mylohyoid ridge
- B. Incisive papilla
- C. Hamular notch
- D. Maxillary tuberosity

16. The curve of Spee is viewed primarily in which plane?

- A. Horizontal plane only
- B. Coronal plane only
- C. Sagittal plane
- D. Frontal plane only

17. The curve of Wilson describes which occlusal relationship?

- A. Vertical dimension at rest
- B. Horizontal overlap of incisors
- C. Mediolateral curvature of posterior occlusal surfaces
- D. Anteroposterior arch curvature only

18. Which term describes a mandibular position determined by the condyles rather than tooth contact?

- A. Centric relation
- B. Maximum intercuspation
- C. Overjet
- D. Crossbite

19. Which description best fits a posterior crossbite?

- A. The arches have no posterior contact
- B. Only the incisors guide protrusion
- C. Anterior teeth have increased vertical overlap
- D. Posterior teeth occlude in a reversed buccolingual relationship

20. Which permanent anterior tooth normally has the greatest mesiodistal crown width?

- A. Maxillary lateral incisor
- B. Maxillary central incisor
- C. Mandibular central incisor
- D. Mandibular lateral incisor

21. Which tooth commonly has a prominent lingual cusp that is much smaller than its buccal cusp?

- A. Maxillary first molar
- B. Mandibular first molar
- C. Mandibular first premolar
- D. Maxillary central incisor

22. In a fixed partial denture, what term describes the component attached to an abutment that supports the prosthesis?

- A. Occlusal rim
- B. Retainer
- C. Custom tray
- D. Pontic

23. What is an embrasure in dental anatomy?

- A. A denture processing mold
- B. A removable die pin
- C. A casting reservoir
- D. Open spaces around adjacent-tooth contacts

24. What does “refractory” mean when describing a laboratory material?

- A. Able to withstand high processing temperatures without unacceptable breakdown
- B. Designed to dissolve rapidly in water
- C. Intended only for shade selection
- D. Unable to tolerate heating

25. Which term identifies the vertical distance between selected points on the maxilla and mandible?

- A. Survey line
- B. Path of insertion
- C. Overjet
- D. Vertical dimension

26. A laboratory measures the thickness of a connector. Which unit is most appropriate?

- A. Degrees Celsius
- B. Grams
- C. Millimeters
- D. Milliliters

27. Which term describes reproducing the positional relationship of a component so it can be relocated accurately later?

- A. Indexing
- B. Glazing
- C. Divesting
- D. Annealing

28. What articulator setting primarily represents the posterior guidance produced by the patient's temporomandibular joints?

- A. Cast base thickness
- B. Condylar guidance
- C. Shade value
- D. Incisal pin length

29. A face-bow record is used before mounting the maxillary cast. What relationship is being transferred?

- A. The implant torque to the analog
- B. The alloy to the burnout furnace
- C. The denture shade to the flask
- D. The maxillary arch to an approximate hinge-axis reference

30. What is Bennett movement?

- A. Side shift of the mandible associated with lateral excursion
- B. Vertical closure into maximum intercuspation
- C. Posterior opening caused by the incisal pin
- D. Rotation of a cast on its mounting plate

31. Why should the incisal pin normally contact the guide table at the established vertical position during mounting and adjustment?

- A. It changes ceramic translucency
- B. It removes proximal contacts
- C. Maintain the recorded cast vertical relationship
- D. It increases gypsum strength

32. A mounting record is distorted and holds the casts apart. What problem can result?

- A. Reduced alloy oxidation
- B. An inaccurate occlusal relationship on the articulator
- C. A stronger gypsum cast
- D. Improved shade matching

33. Which articulator is most appropriate when only simple hinge opening and closing are required?

- A. A fully adjustable articulator
- B. A pantographic recorder
- C. A nonadjustable hinge articulator
- D. A computerized milling unit

34. What reaction occurs when gypsum powder is mixed with water and sets?

- A. Wax converts into metal alloy
- B. Calcium sulfate hemihydrate converts to dihydrate crystals
- C. Silicone polymer turns into gypsum
- D. Acrylic monomer becomes porcelain

35. Why does an excessively high water-to-powder ratio generally weaken a gypsum cast?

- A. More excess water leaves greater porosity after setting
- B. It converts gypsum into acrylic
- C. It creates more metal oxide
- D. It eliminates all setting expansion

36. Which gypsum product is commonly used for a strong removable-prosthetic master cast when extreme die strength is not required?

- A. Impression compound
- B. Modeling wax
- C. Phosphate-bonded investment
- D. Type III dental stone

37. Why can a finished wax pattern change shape if it is left unsupported for an extended period?

- A. The alloy oxidizes inside the wax
- B. Residual stresses and wax flow can cause distortion
- C. Gypsum expands through the wax
- D. Wax becomes a ceramic crystal

38. What is the main purpose of investment expansion during casting procedures?

- A. Increase the shade value of porcelain
- B. Make the wax pattern softer
- C. Eliminate the need for a sprue
- D. Help compensate for contraction of the cast material

39. Why is a phosphate-bonded investment selected for many high-fusing alloys?

- A. It dissolves the alloy after casting
- B. It functions as denture base resin
- C. It tolerates higher burnout and casting temperatures
- D. It prevents all metal shrinkage

40. Which property describes a material's resistance to indentation or scratching?

- A. Hardness
- B. Solubility
- C. Translucency
- D. Ductility

41. Which property describes the ability of a metal to deform plastically in tension before fracture?

- A. Solubility
- B. Brittleness
- C. Opacity
- D. Ductility

42. Why is thermal-expansion compatibility important in a layered metal-ceramic restoration?

- A. It determines the tooth number
- B. It replaces the oxide bond
- C. Mismatch can create damaging stresses during heating and cooling
- D. It controls gypsum water ratio

43. What is the principal purpose of an alloy oxide during conventional metal-ceramic bonding?

- A. Provide a surface that contributes to chemical bonding with porcelain
- B. Prevent every type of corrosion
- C. Create the final glaze automatically
- D. Lubricate the die during seating

44. Which polymer forms the basis of most conventional heat-cured denture base resins?

- A. Lithium disilicate
- B. Polymethyl methacrylate
- C. Polyvinyl siloxane
- D. Calcium sulfate

45. What can contribute to porosity in a heat-processed acrylic denture base?

- A. Correct controlled polymerization
- B. Monomer boiling or inadequate processing pressure
- C. Proper flask closure
- D. Adequate dough-stage packing

46. Why is a separating medium applied to gypsum during acrylic denture processing?

- A. Keep acrylic from bonding to gypsum
- B. Make ceramic more translucent
- C. Convert the cast to refractory material
- D. Increase the alloy melting range

47. During soldering, what is the main function of flux?

- A. Block solder from selected areas
- B. Create a resin impression
- C. Reduce oxides and improve solder flow
- D. Increase porcelain opacity

48. Solder is flowing beyond the intended joint area. Which material is used to create a boundary that limits that flow?

- A. Increase solder wetting everywhere
- B. Dissolve the investment mold
- C. Cure acrylic resin around the joint
- D. Restrict solder flow to selected areas

49. Freshly mixed investment beads away from a wax pattern. Why might the technician apply a wetting agent first?

- A. Improve investment wetting of the wax
- B. Create a metal oxide layer
- C. Polymerize the impression material
- D. Increase wax distortion deliberately

50. What is a primary use of a wax solvent in laboratory procedures?

- A. Create porcelain fluorescence
- B. Harden gypsum by hydration
- C. Remove or soften residual wax on selected surfaces
- D. Sinter zirconia to full density

51. Which abrasive is especially suited for grinding very hard ceramics and zirconia?

- A. Pumice only
- B. Diamond abrasive
- C. Tin foil
- D. Alginate powder

52. Why are polishing procedures commonly performed from coarser to progressively finer abrasives?

- A. The sequence changes alloy composition
- B. Coarse abrasives always produce the final shine
- C. Fine abrasives create deeper scratches first
- D. Each step removes scratches produced by the preceding coarser step

53. Which impression material is known for high elastic recovery and dimensional stability after setting?

- A. Inlay wax
- B. Impression plaster
- C. Modeling compound
- D. Polyvinyl siloxane

54. Which elastomeric impression material is relatively stiff after setting and can be difficult to remove from pronounced undercuts?

- A. Alginate
- B. Inlay wax
- C. Polyether
- D. Dental stone

55. What change can occur when an alginate impression loses water to the environment?

- A. Sintering into a ceramic
- B. Shrinkage from syneresis and evaporation
- C. Conversion to PMMA
- D. Expansion from metal oxidation

56. What can happen if an alginate impression is stored immersed in water?

- A. It may swell by imbibition
- B. It develops a porcelain glaze
- C. It becomes a metal alloy
- D. It permanently hardens as gypsum

57. Which ceramic is a polycrystalline material widely used for high-strength monolithic restorations?

- A. Feldspathic porcelain only
- B. Polyether
- C. PMMA
- D. Zirconia

58. An anterior restoration requires an esthetic translucent glass-ceramic. Which material best matches that description?

- A. Lithium disilicate
- B. Type III gypsum
- C. Polyether
- D. Cobalt-chromium alloy

59. What does a die hardener primarily do when applied to a gypsum die?

- A. Dissolve the finish line
- B. Harden the die surface against abrasion
- C. Create the cement space automatically
- D. Increase porcelain fluorescence

60. A technician applies thin controlled layers to a crown die while leaving the margin area clear. What is the purpose of those layers?

- A. Increase external crown height
- B. Replace the finish line
- C. Create controlled internal relief for the luting agent
- D. Eliminate all proximal contact

61. Which cement property most directly affects whether a thin layer can remain beneath a fully seated restoration?

- A. Gypsum setting time
- B. Film thickness
- C. Wax flow
- D. Shade tab number

62. Before designing from an intraoral scan, what defect should make the technician request additional data?

- A. A continuous mesh away from the preparation
- B. A clearly captured opposing arch
- C. A missing or unreadable preparation margin
- D. A complete bite scan

63. A gypsum cast has a small raised nodule on a cusp tip. What is the most likely cause?

- A. Excessive die spacer
- B. A missing impression area
- C. Porcelain overfiring
- D. An air bubble against the impression

64. Why should a definitive impression be examined under magnification before it is poured?

- A. Find defects that would invalidate the cast
- B. To select the denture tooth shade
- C. To change the prescribed material
- D. To increase the stone setting expansion

65. What is one advantage of a custom impression tray over a poorly fitting stock tray?

- A. It automatically records centric relation
- B. It can provide more controlled and uniform impression material thickness
- C. It eliminates the need for impression material
- D. It guarantees every margin is captured

66. When sectioning a removable die, what must be preserved most carefully?

- A. The preparation finish line and adjacent working surfaces
- B. The cast base color
- C. The shipping label
- D. The articulator brand name

67. Why is a complete opposing arch record important for many restorations?

- A. It replaces the preparation scan
- B. It disinfects the working model
- C. Establish occlusal form and opposing clearance
- D. It determines alloy chemistry

68. A digital scan shows duplicated surface patches and discontinuities near the preparation. What is the concern?

- A. The ceramic glaze is too thick
- B. The material has already sintered
- C. The gypsum has absorbed water
- D. A stitching or acquisition error may have distorted the geometry

69. Why should a working cast have a stable, adequately trimmed base?

- A. It increases impression tear strength
- B. It supports repeatable seating, handling, and articulation without rocking
- C. It changes the patient's jaw relation
- D. It eliminates the need for indexing

70. If an impression material has uncertain compatibility with a disinfectant, what is the best laboratory approach?

- A. Follow the impression manufacturer's disinfection guidance
- B. Skip disinfection without communication
- C. Use the strongest chemical available
- D. Extend immersion time indefinitely

71. A container bears the GHS flame pictogram. What type of hazard should the technician anticipate?

- A. A tooth-numbering error
- B. An anatomical landmark
- C. A flammability or related fire hazard
- D. A gypsum expansion limit

72. What is the best control for reducing dust exposure directly where a technician grinds a prosthesis?

- A. Opening a distant office door
- B. Local exhaust ventilation at the source
- C. Wearing street clothing
- D. Increasing the grinder speed only

73. When grinding or polishing materials that can produce flying particles, what protection is most directly indicated?

- A. Only hearing protection
- B. No protection if the task is brief
- C. Only a cloth apron
- D. Appropriate eye and face protection

74. Why should compressed-gas cylinders be secured upright or otherwise protected from falling?

- A. It prevents acrylic polymerization
- B. It improves denture shade
- C. Valve damage can create a dangerous high-energy release
- D. It increases gypsum strength

75. A technician encounters a chemical spill but does not know the material or its hazards. What is the safest first response?

- A. Wipe it up with bare hands
- B. Mix another chemical into it
- C. Smell it closely to identify it
- D. Keep people away and follow the laboratory emergency procedure

76. An impression arrives with no documentation showing it was disinfected. What should laboratory personnel do before routine handling?

- A. Clean and disinfect it using a compatible approved procedure
- B. Assume the dental office disinfected it
- C. Polish it before decontamination
- D. Place it directly on the production bench

77. Why should contaminated laboratory items be kept out of clean production areas until decontaminated?

- A. To reduce cross-contamination of personnel, equipment, and cases
- B. To accelerate gypsum setting
- C. To improve ceramic translucency
- D. To increase alloy hardness

78. What is the safest disposal approach for used burs, blades, or orthodontic wire segments capable of puncturing skin?

- A. Throw them loose into general trash
- B. Leave them on the bench for reuse
- C. Wrap them only in paper tissue
- D. Place them in an appropriate puncture-resistant sharps container

79. Why should food and beverages be excluded from chemical handling and contaminated-work areas?

- A. They improve resin curing
- B. They prevent dust from forming
- C. They can become contaminated and create an ingestion route
- D. They change the patient's occlusion

80. What should a technician verify before selecting gloves for handling a hazardous laboratory chemical?

- A. The patient tooth number
- B. Chemical compatibility information for the glove material
- C. Only the glove color
- D. Only the package size

81. Before starting a layered ceramic restoration, what should the technician evaluate on the mounted casts or digital records?

- A. Available space, occlusion, margins, and restorative design requirements
- B. Only the shipping date
- C. Only the die color
- D. Only the articulator brand

82. Why should veneering ceramic be supported by an appropriately contoured substructure?

- A. Support eliminates firing shrinkage
- B. Unsupported porcelain is more vulnerable to fracture under function
- C. Support replaces occlusal adjustment
- D. Support makes porcelain dissolve

83. What is the purpose of a cutback design in a layered ceramic restoration?

- A. Increase cement thickness at the finish line
- B. Remove the preparation margin
- C. Create veneering space while preserving core support
- D. Eliminate the core entirely

84. During porcelain firing, why is vacuum commonly used during part of the cycle?

- A. To make the alloy magnetic
- B. To replace the need for temperature control
- C. To convert porcelain into acrylic
- D. To help reduce entrapped porosity in the fired ceramic

85. A restoration appears too bright compared with the prescribed shade even though hue is close. Which color dimension is most likely too high?

- A. Translucency only
- B. Fluorescence only
- C. Value
- D. Chroma

86. What is metamerism in shade matching?

- A. A porcelain layer with no opacity
- B. A crack caused by thermal shock
- C. A margin open only on the die
- D. Two colors match under one light source but differ under another

87. Why should surface texture be considered during final ceramic contouring?

- A. Texture determines the tooth number
- B. Influence reflected light and perceived tooth form
- C. Texture controls gypsum expansion
- D. Texture replaces proximal contact

88. After adjusting a ceramic occlusal surface, why is repolishing important?

- A. Smooth roughness created by ceramic adjustment
- B. Polishing replaces sintering
- C. Polishing changes the preparation taper
- D. Polishing increases the crown margin opening

89. What is the purpose of internal characterization in some translucent ceramic restorations?

- A. Add controlled color effects beneath the final surface layer
- B. Create an impression tray border
- C. Increase gypsum die strength
- D. Join a metal connector

90. Why should a ceramic restoration be cooled according to the prescribed firing cycle rather than quenched rapidly?

- A. Cooling determines the tooth number
- B. Cooling increases cement film thickness
- C. Cooling turns zirconia into gypsum
- D. Rapid cooling can create thermal stress and cracking

91. Which condition most strongly favors a monolithic ceramic design over a heavily layered one?

- A. A requirement to remove all occlusal anatomy
- B. A case with no need for structural support
- C. Limited space where maintaining material strength is critical
- D. A need for unlimited veneering thickness

92. What should be included in final quality control of a ceramic crown before delivery?

- A. Only the laboratory invoice
- B. Margins, contacts, occlusion, contour, shade, and surface finish
- C. Only the shade tab number
- D. Only the casting sprue

93. Why are border extensions on a complete denture important?

- A. They determine ceramic firing temperature
- B. They replace tooth arrangement
- C. They eliminate the need for impressions
- D. Provide support, stability, and peripheral seal

94. What is the purpose of relief over selected sensitive or non-supporting areas on a denture master cast?

- A. Make denture teeth more translucent
- B. Create a metal oxide layer
- C. Reduce pressure on poorly load-bearing tissues
- D. Increase occlusal vertical dimension automatically

95. A record base rocks on the master cast. Why is this unacceptable before jaw-relation records are made?

- A. Instability can distort the recorded maxillomandibular relationship
- B. It makes processing shrinkage impossible
- C. It improves balanced occlusion
- D. It increases tooth shade value

96. What is the principal purpose of a wax occlusion rim on a stable record base?

- A. Provide the final polished denture surface
- B. Establish and communicate jaw relation and tooth-position references
- C. Replace the master cast
- D. Serve as a casting investment

97. Why is the compensating curve developed in many balanced complete-denture setups?

- A. To create an anterior crossbite
- B. To help maintain posterior contacts during eccentric movements
- C. To increase processing porosity
- D. To eliminate all cusp anatomy

98. Why should mandibular posterior denture teeth generally remain over the primary support area of the residual ridge?

- A. To increase resin porosity
- B. To create maximum buccal overhang
- C. To eliminate tongue space
- D. To reduce destabilizing leverage on the denture base

99. What processing error can contribute to internal porosity in a thick acrylic denture base?

- A. Excessive exothermic heat during an uncontrolled cure
- B. Proper slow polymerization
- C. Correct packing pressure
- D. Adequate bench cooling

100. Why is bench cooling often recommended before a processed denture is deflasked?

- A. It increases the wax rim height
- B. It changes tooth mold selection
- C. Gradual cooling helps reduce warpage from thermal stress
- D. It makes the resin liquid again

101. What is the main purpose of a laboratory remount after complete-denture processing?

- A. Correct occlusal discrepancies created during processing
- B. Add a posterior palatal seal to the cast
- C. Change the denture base color
- D. Replace the patient prescription

102. When repairing a fractured acrylic denture base, why is the fracture area often opened or beveled before adding repair resin?

- A. It reduces all need for alignment
- B. It makes the acrylic ceramic
- C. Create repair space and greater bonding area
- D. It eliminates polymerization shrinkage

103. Which procedure replaces most or all of the existing denture base while keeping the established tooth arrangement?

- A. Occlusal adjustment
- B. Tooth reset only
- C. Reline
- D. Rebase

104. Which surface of a complete denture should not be aggressively polished because dimensional change can alter fit?

- A. The accessible labial festooning
- B. The tissue-bearing intaglio surface
- C. The external cameo surface
- D. The polished facial flange

105. Why is a clearly defined finish line essential when fabricating a crown?

- A. It establishes where the restoration margin must terminate and adapt
- B. It determines the patient's tooth number
- C. It replaces the opposing cast
- D. It creates the solder gap

106. What is the purpose of a common path of insertion for multiple fixed retainers in a bridge?

- A. Eliminate connector strength requirements
- B. Allow all connected retainers to seat together
- C. Create independent insertion directions
- D. Increase porcelain firing temperature

107. Why should the cross-sectional bulk of a fixed partial denture connector be adequate?

- A. Thin connectors eliminate flexure
- B. A larger connector always improves esthetics
- C. Connector strength depends strongly on its dimensions and shape
- D. Connector bulk determines tooth numbering

108. What is the main function of a pontic in a fixed partial denture?

- A. Serve as the prepared abutment
- B. Record centric relation
- C. Act as the casting sprue
- D. Replace the clinical crown of a missing tooth

109. Why is cervical overcontour undesirable on many crowns?

- A. Compromise emergence form and gingival plaque control
- B. It improves every contact
- C. It creates a more accurate finish line
- D. It always increases retention

110. During wax-pattern finishing, why should the margin be thin, continuous, and accurately adapted?

- A. Investment automatically repairs missing wax
- B. Thick wax always casts thinner
- C. Irregular wax margins are reproduced in the final restoration
- D. Margin defects disappear during burnout

111. A casting contains rounded voids near a thick section. Which process problem may be involved?

- A. Correct proximal contact
- B. Entrapped gas or shrinkage porosity during solidification
- C. Adequate reservoir design in every case
- D. Properly finished die spacer

112. During casting, why is a reservoir positioned near a wax pattern in the sprue system?

- A. Prevent investment expansion
- B. Replace the wax pattern
- C. Create the proximal contact
- D. Feed molten metal into solidifying sections

113. Why is a controlled solder gap important when joining fixed prosthodontic components?

- A. Provide a stable gap for solder flow
- B. The gap determines ceramic shade
- C. No gap always gives better flow
- D. A wide gap prevents distortion completely

114. When adjusting a heavy proximal contact on a crown, what should the technician protect?

- A. The casting sprue attachment
- B. Preserve contact location and surrounding contour
- C. The die base color
- D. The articulator manufacturer label

115. Which finding should prevent final delivery of a crown even if shade and contour are acceptable?

- A. A stable proximal contact
- B. A correct occlusal relationship
- C. An open margin on the definitive die
- D. A smooth polished surface

116. What should be verified after finishing and polishing a cast metal crown?

- A. Only the cast-base thickness
- B. Only the metal color
- C. Only the sprue location
- D. Fit, margin integrity, contacts, occlusion, contour, and surface quality

117. Which type of tooth movement changes the angulation of the crown while the root apex moves in the opposite direction?

- A. Pure translation
- B. Intrusion only
- C. Rotation only
- D. Tipping

118. A removable orthodontic appliance contains a midline expansion screw. What is that component intended to do when activated?

- A. Join metal by soldering
- B. Create the final occlusal polish
- C. Deliver controlled expansion when activated as prescribed
- D. Provide only passive retention

119. Which component commonly provides retention around a molar on a removable orthodontic appliance?

- A. Adams clasp
- B. Implant analog
- C. Pontic
- D. Occlusal rim

120. What is a common purpose of a Hawley-type labial bow?

- A. Create the gypsum master cast
- B. Provide anterior tooth control and contribute to retention
- C. Replace the acrylic base
- D. Serve as the expansion screw

121. Why are helical loops added to some orthodontic wire springs?

- A. Eliminate all activation
- B. Increase wire length and flexibility within a compact space
- C. Create a solder joint automatically
- D. Make the wire more brittle

122. Why should acrylic around an orthodontic screw or spring be thick enough for support but not excessive?

- A. Bulk has no effect on comfort
- B. More acrylic always improves every appliance
- C. Thin unsupported acrylic cannot fracture
- D. Support the component without excessive bulk

123. What is the main reason to avoid nicking stainless-steel orthodontic wire during adjustment?

- A. Nicks make acrylic cure faster
- B. Nicks improve solder flow everywhere
- C. Surface damage can concentrate stress and fracture
- D. Nicks increase gypsum strength

124. What does a bite plate in a removable orthodontic appliance primarily alter?

- A. Occlusal contact or vertical relationship for a prescribed purpose
- B. The tooth numbering system
- C. The gypsum setting reaction
- D. The chemical composition of wire

125. What is an important advantage of thermoforming for a clear retainer?

- A. It makes all undercuts harmless
- B. It eliminates the need for trimming
- C. It works without a model or scan
- D. It can closely adapt a heated sheet over an accurate model

126. After an orthodontic wire joint is soldered, the connection is bulky and rough. Why should it be finished and polished?

- A. To reverse the solder reaction
- B. Remove rough excess material that could irritate tissue
- C. To make the wire nonmetallic
- D. To increase acrylic porosity

127. A removable appliance has an active spring that contacts the wrong tooth on the cast. What should happen before delivery?

- A. Remove all retention instead
- B. Cover the error with additional acrylic
- C. Correct the component so it matches the prescribed target tooth
- D. Deliver it and expect oral tissues to redirect it

128. Which final inspection finding is most important for a removable orthodontic appliance?

- A. The appliance seats fully without sharp edges or unintended interferences
- B. The acrylic is intentionally overextended
- C. The model base is a preferred color
- D. The wire is the longest possible

129. Which Kennedy classification describes a single edentulous area that crosses the midline anterior to the remaining teeth?

- A. Class I
- B. Class II
- C. Class IV
- D. Class III

130. A surveyed RPD design includes parallel prepared surfaces on selected abutments. What function do these guide planes serve?

- A. Increase casting temperature
- B. Help establish a controlled path of insertion and removal
- C. Serve as the acrylic finish line only
- D. Create the denture tooth shade

131. What does the survey line on an abutment tooth represent?

- A. Height of contour relative to insertion path
- B. The denture base thickness
- C. The gingival margin depth only
- D. The casting sprue location

132. What is the purpose of reciprocation in a clasp assembly?

- A. Increase acrylic polymerization
- B. Create an implant emergence profile
- C. Replace the occlusal rest
- D. Counter lateral forces from the flexing retentive arm

133. Why must a major connector be sufficiently rigid?

- A. Rigidity determines tooth shade
- B. The connector should move independently on each side
- C. Flexibility always improves support
- D. It must distribute functional forces without flexing between connected components

134. What is the primary role of an occlusal rest in an RPD?

- A. Replace the denture base
- B. Provide vertical support and help prevent tissueward movement
- C. Provide all direct retention
- D. Create the major connector

135. In a distal-extension RPD, why is an indirect retainer positioned away from the fulcrum line?

- A. It increases ceramic translucency
- B. It replaces the distal-extension base
- C. Improve leverage against rotational lifting
- D. It creates the retentive undercut

136. What is the purpose of an internal finish line where acrylic resin meets an RPD framework?

- A. Create a defined metal-resin junction
- B. Record centric relation
- C. Control the alloy melting range
- D. Set the tooth shade

137. Why are retentive mesh or lattice areas kept away from surfaces that must remain exposed metal?

- A. They replace all minor connectors
- B. They create tooth undercuts
- C. They improve ceramic glaze
- D. Embed in acrylic rather than remain exposed

138. A technician duplicates an RPD master cast in a heat-resistant material before waxing the metal framework. What is this duplicate used for?

- A. Provide a heat-resistant form for framework waxing
- B. Serve as the final intraoral prosthesis
- C. Record the patient shade
- D. Replace the metal alloy

139. Why may an altered-cast procedure be used for a distal-extension RPD?

- A. To eliminate all tooth support
- B. Refine framework relation to distal-extension tissues
- C. To change the alloy composition
- D. To convert the case into a fixed bridge

140. What should be preserved when finishing and polishing an RPD framework?

- A. Excess metal on tissue surfaces
- B. Only the casting sprue remnant
- C. Designed rests, clasp dimensions, guide surfaces, and fitting areas
- D. All surface irregularities

141. What does an implant analog reproduce on a laboratory master cast?

- A. The patient's gingival shade only
- B. Implant position and connection geometry
- C. The porcelain firing cycle
- D. The denture flask volume

142. Why are implant impression copings splinted in some multi-implant impression techniques?

- A. To create a casting sprue
- B. To eliminate the impression material
- C. To increase resin translucency
- D. Limit coping movement and preserve implant relationships

143. What is the purpose of a verification jig in a multi-implant case?

- A. Confirm cast accuracy against intraoral implant positions
- B. Replace every impression coping
- C. Determine the ceramic shade
- D. Increase the denture tooth size

144. A rigid multi-implant framework seats on one implant but lifts slightly at another before any screws are tightened. Why is this finding important?

- A. Passive fit increases cement thickness
- B. Passive fit changes implant diameter
- C. Misfit can create strain during screw tightening
- D. A framework should intentionally rock

145. What is the main function of a scan body in implant CAD workflow?

- A. Serve as the healing tissue itself
- B. Act as a polishing abrasive
- C. Register implant position and orientation in software
- D. Provide final occlusal porcelain

146. What is an emergence profile?

- A. Cervical contour through peri-implant soft tissue
- B. The setting expansion of stone
- C. The path of a casting sprue
- D. The shade of the implant analog

147. Why is the screw-access channel position important in a screw-retained implant crown?

- A. It determines the gypsum type
- B. It replaces component compatibility
- C. It controls the patient's jaw relation
- D. Affects access, esthetics, occlusion, and material thickness

148. What is a titanium base commonly used for in a hybrid implant restoration?

- A. Replace the master cast
- B. Connect a separate restoration to the implant
- C. Serve as denture processing plaster
- D. Create the final impression tray

149. Why is a gingival mask useful on an implant master cast?

- A. It prevents every screw loosening event
- B. Simulate soft tissue for cervical contour evaluation
- C. It determines casting temperature
- D. It replaces the implant analog

150. What is the main function of a bar in an implant overdenture?

- A. Act as the impression material
- B. Replace every denture tooth
- C. Splint implants and retain or support the overdenture
- D. Create porcelain translucency

151. Why must implant screws, analogs, scan bodies, and restorative components be matched to the intended system?

- A. Visual similarity guarantees compatibility
- B. Mixing parts always improves passive fit
- C. All implant systems use identical parts
- D. System-specific connection geometry may not interchange

152. What should the technician evaluate in the occlusion of an implant-supported restoration?

- A. Stable prescribed contacts without avoidable premature or excursive interference
- B. Only the screw-head color
- C. The heaviest possible contact in every excursion
- D. No consideration of the opposing arch

153. During intraoral scanning, why is a continuous scan path helpful?

- A. It increases zirconia firing temperature
- B. It changes implant platform size
- C. Maintain tracking for accurate image stitching
- D. It replaces the bite record automatically

154. What is the purpose of digitally marking a preparation margin in CAD software?

- A. Define the restoration margin boundary
- B. Set the gypsum water ratio
- C. Identify the patient's muscle anatomy
- D. Select the shipping carrier

155. Why is a restoration's insertion axis evaluated during CAD design?

- A. To replace proximal contact design
- B. To determine ceramic shade value only
- C. To increase scanner resolution after capture
- D. Check seating path and identify undercuts

156. In CAM milling, why must the diameter of the milling tool be considered during design?

- A. Bur diameter changes the tooth number
- B. Tool geometry limits reproducible internal detail
- C. Smaller burs eliminate all wear
- D. Tool size determines patient jaw relation

157. What is the main purpose of support structures in many vat-polymerized dental prints?

- A. Replace washing and post-curing
- B. Stabilize and hold the part during printing
- C. Determine the implant connection
- D. Create the final polished surface

158. Why must a printed dental resin part be washed according to the material workflow before final post-curing?

- A. Remove uncured surface resin before post-curing
- B. To create a gypsum cast
- C. To sinter zirconia grains
- D. To convert resin into metal

159. Why is shrinkage compensation built into many presintered-zirconia CAM workflows?

- A. Zirconia expands without limit during firing
- B. The scan is intentionally enlarged after sintering
- C. Compensation creates the preparation margin
- D. The milled restoration becomes smaller as zirconia densifies during sintering

160. What is the purpose of nesting multiple restorations in a milling disk?

- A. Disinfect the digital scan
- B. Select the patient tooth shade
- C. Arrange parts efficiently within milling material
- D. Record centric relation

Practice Exam 7: Answer Key and Explanations

1. D - Conflicting case records create a traceability and authorization problem. Fabrication should pause until the prescription and controlled production information agree, because choosing a material independently can create an unauthorized device and break documentation continuity. Resolve discrepancies before irreversible work begins so the finished device matches the authorized case record. That distinction supports accurate, predictable laboratory quality control.

2. B - Privacy protection means using only information needed for the legitimate purpose and avoiding unnecessary identifiers. A training example rarely requires the full prescription or identifiable patient details, so limiting the information reduces inappropriate access and disclosure. Use the least amount of patient information reasonably needed for the task. That distinction supports accurate, predictable laboratory quality control.

3. A - Lot information links a specific material batch to the devices produced from it. If a manufacturer later reports contamination, defect, or recall concerns, the laboratory can identify potentially affected cases instead of treating every case as equally suspect. Traceability supports focused investigation, corrective action, and communication when a batch-related problem arises.

4. C - The technician should not independently change a prescribed design or material when viability is questionable. Clarification with the prescribing dentist preserves professional roles, creates a documented decision, and prevents fabrication of a restoration that may not meet the intended clinical requirements. When prescription details conflict with technical feasibility, communicate before changing the case.

5. D - The work authorization or prescription states what the dentist is requesting for that patient and provides the case-specific basis for laboratory fabrication. Administrative documents, advertising, and internal schedules may support operations but do not authorize the patient's prosthesis or restoration. Use the prescription as the primary case directive and seek clarification when required information is missing.

6. A - A Safety Data Sheet provides standardized information about a hazardous chemical, including hazards, handling, protective measures, and emergency response. OSHA Hazard Communication requires required SDS information to be readily accessible to employees during the work shift. Technicians should consult the SDS before using an unfamiliar hazardous chemical or responding to an exposure.

7. B - Scope-of-practice authority comes from the laws and regulations that govern the location where the work is performed. Laboratory custom, vendor directions, or another state's rules cannot expand activities that local law restricts. Technical competence does not override legal scope, so technicians must work within applicable jurisdictional requirements. That distinction supports accurate, predictable laboratory quality control.

8. C - In canine-guided occlusion, the canines on the working side carry the principal guidance during lateral movement, allowing posterior teeth to disclude. Nonworking posterior contacts are generally undesirable interferences rather than the intended guiding contact. Identify the working side first, then evaluate whether canine guidance is separating posterior contacts appropriately. That distinction supports accurate, predictable laboratory quality control.

9. A - The maxillary first molar commonly exhibits an oblique ridge extending from the mesiolingual toward the distobuccal cusp area. A five-cusp Y pattern is associated with the mandibular first molar, while the other descriptions do not represent normal molar anatomy. Recognizing major occlusal landmarks helps technicians reproduce functional morphology during waxing and digital design.

10. C - Maxillary molars typically have three roots: two buccal and one palatal. Mandibular molars usually have two roots, and anterior teeth generally have one. Root form is useful background anatomy even when the technician is primarily reproducing crown morphology. Knowing tooth-specific anatomy improves identification of casts, digital scans, and restoration contours.

11. B - Universal numbering begins at the maxillary right third molar as number 1, proceeds across the maxillary arch, then continues from the mandibular left third molar as number 17. Number 19 is therefore the mandibular left first molar. Accurate numbering prevents communication errors when prescriptions and laboratory records refer to specific teeth.

12. D - In FDI notation for permanent teeth, the first digit identifies the quadrant and the second digit identifies the tooth from the midline. Quadrant 3 is mandibular left, and position 6 is the first molar. Reading both digits correctly is essential when translating prescriptions between numbering systems. That distinction supports accurate, predictable laboratory quality control.

13. B - The lateral pterygoids contribute strongly to mandibular protrusion when contracting bilaterally and also participate in lateral movements. Masseter and temporalis are major elevators, while orbicularis oris is a muscle of facial expression around the lips. Understanding muscle function helps connect articulator movements with the patient movements they are intended to simulate.

14. D - The medial pterygoid is a muscle of mastication that elevates the mandible and works with the masseter as a muscular sling around the ramus. Buccinator, mentalis, and platysma have different facial or soft-tissue functions. Muscle anatomy is relevant when interpreting mandibular movement, facial form, and functional occlusal relationships. That distinction supports accurate, predictable laboratory quality control.

15. A - The mylohyoid ridge is a mandibular lingual landmark that can influence the contour and extension of a mandibular denture flange. The incisive papilla, hamular notch, and maxillary tuberosity are maxillary landmarks. Correct landmark identification helps prevent overextension and supports appropriate denture base contour. That distinction supports accurate, predictable laboratory quality control.

16. C - The curve of Spee describes the anteroposterior curvature of the occlusal surfaces and is appreciated in the sagittal plane. The curve of Wilson describes mediolateral curvature more closely associated with the frontal plane. Distinguishing occlusal curves helps technicians develop functional posterior tooth arrangement and restorative morphology. That distinction supports accurate, predictable laboratory quality control.

17. C - The curve of Wilson reflects the side-to-side curvature created by the inclinations of posterior teeth. It differs from the curve of Spee, which runs anteroposteriorly, and from overjet or vertical-dimension concepts. Both occlusal curves influence cusp relationships, tooth arrangement, and the shape of functional occlusal tables. That distinction supports accurate, predictable laboratory quality control.

18. A - Centric relation is a reproducible maxillomandibular relationship referenced to the condylar position and is independent of tooth contact. Maximum intercuspation is determined by tooth fit, while overjet and crossbite describe tooth relationships. The distinction matters when mounting casts and evaluating jaw records that may not coincide with habitual tooth contact.

19. D - A posterior crossbite occurs when normal buccolingual relationships of posterior teeth are reversed for one or more teeth. It is different from overbite, lack of contact, or anterior guidance patterns. Recognizing crossbite relationships prevents technicians from incorrectly “correcting” a prescribed or patient-specific occlusal arrangement on the cast. That distinction supports accurate, predictable laboratory quality control.

20. B - Among permanent incisors, the maxillary central incisor is the broadest mesiodistally. Mandibular incisors are narrower, and the maxillary lateral incisor is smaller than the adjacent central. Relative tooth proportions guide anterior setup, diagnostic waxing, and restoration design when reproducing natural-looking form. That distinction supports accurate, predictable laboratory quality control. It should be checked before the case advances.

21. C - The mandibular first premolar typically has a dominant buccal cusp and a much smaller, often nonfunctional lingual cusp. Molars have multiple substantial cusps, and incisors do not have premolar-type buccal and lingual cusps. This asymmetry is a useful identifying feature and should be reproduced when designing posterior morphology. That distinction supports accurate, predictable laboratory quality control.

22. B - A retainer is the component of a fixed dental prosthesis that is attached to an abutment and provides support or retention for the prosthesis. A pontic replaces a missing tooth, while rims and trays belong to removable prosthodontic procedures. Correct terminology allows technicians and dentists to communicate design changes without ambiguity.

23. D - Embrasures are the spillway spaces surrounding the proximal contact areas of adjacent teeth. Their contours affect cleansability, food escape, gingival form, and esthetics. The other choices refer to laboratory devices or processing structures. Restorations should reproduce appropriate embrasure form rather than simply closing every interproximal space. That distinction supports accurate, predictable laboratory quality control.

24. A - A refractory material maintains useful form and properties during elevated-temperature procedures such as firing, soldering, or casting-related processes. It is not defined by water solubility or shade use. Technicians select refractory materials when the supporting form must survive heat that ordinary gypsum or polymers may not tolerate. That distinction supports accurate, predictable laboratory quality control.

25. D - Vertical dimension describes the vertical separation between reference points on the maxilla and mandible at a specified jaw position. Overjet is horizontal anterior overlap, a survey line identifies contour, and path of insertion describes prosthesis movement. Using precise terminology helps avoid confusion when communicating jaw relation records and denture setup changes.

26. C - Connector thickness is a linear dimension, so millimeters are appropriate. Grams measure mass, milliliters measure volume, and degrees Celsius measure temperature. Selecting the correct unit is basic to interpreting design specifications and manufacturer instructions. Unit errors can produce restorations that are too thin, too bulky, or processed under incorrect conditions.

27. A - Indexing creates a reproducible positional reference so casts, components, or sections can be returned to a known relationship. Glazing is a ceramic surface procedure, divesting removes investment, and annealing is a heat treatment. Accurate indexes are especially useful when components must be separated and then reassembled without losing alignment. That distinction supports accurate, predictable laboratory quality control.

28. B - Condylar guidance settings simulate the path of the condylar elements during eccentric movement. Incisal components influence anterior guidance on the articulator, while cast thickness and shade do not control mandibular movement. Correct posterior guidance settings help the articulator reproduce excursive relationships more realistically than a simple hinge device. That distinction supports accurate, predictable laboratory quality control.

29. D - A face-bow relates the maxillary arch to an approximate transverse hinge-axis or articulator reference. It does not record material processing parameters, shade, or implant torque. The transfer improves the spatial orientation of the maxillary cast when a semi-adjustable articulator is used. A small mounting or articulator error can become a significant occlusal error once the restoration or prosthesis is completed.

30. A - Bennett movement refers to the lateral bodily shift that accompanies a lateral mandibular excursion, particularly on the working side. It is distinct from simple opening, closure, or accidental cast movement. Understanding side shift helps technicians interpret articulator settings and shape posterior occlusion to avoid eccentric interferences. That distinction supports accurate, predictable laboratory quality control.

31. C - The incisal pin serves as a vertical reference on many articulators. Losing contact with the guide table can allow the articulator to close beyond the intended position and alter the mounted relationship. Maintaining the reference helps prevent inadvertent changes in occlusal vertical dimension during laboratory procedures. That distinction supports accurate, predictable laboratory quality control.

32. B - A distorted or bulky mounting record can prevent complete seating of the casts and create a false jaw relationship. This error is transferred into occlusal adjustment and prosthesis fabrication. Records should be stable, accurately seated, and trimmed so they guide rather than interfere with cast positioning. That distinction supports accurate, predictable laboratory quality control.

33. C - A nonadjustable hinge articulator reproduces basic opening and closing without individualized condylar settings. Fully adjustable systems provide more patient-specific movement simulation, while recorders and milling units serve different functions. Choose articulator complexity according to the information available and the functional demands of the case. That distinction supports accurate, predictable laboratory quality control.

34. B - Dental gypsum sets through hydration of calcium sulfate hemihydrate into interlocking calcium sulfate dihydrate crystals. Crystal growth produces the rigid cast and contributes to setting expansion. Understanding the setting reaction explains why mix ratio, spatulation, contamination, and water temperature can influence working properties. Correct processing prevents defects that are difficult to repair later.

35. A - Water beyond what is needed for the gypsum reaction occupies space that later becomes porosity as the water evaporates. Increased porosity reduces strength and surface quality. Following the manufacturer's recommended ratio supports a dense cast with predictable setting and handling characteristics. Correct processing prevents defects that are difficult to repair later.

36. D - Type III dental stone provides greater strength and abrasion resistance than model plaster and is commonly used for many master casts. Investment and wax serve different purposes, and impression compound is an impression material. Material selection should match the required strength, accuracy, surface detail, and subsequent laboratory procedure. Correct processing prevents defects that are difficult to repair later.

37. B - Dental wax is thermoplastic and can retain internal stresses from manipulation. With time and temperature, stress relaxation and flow may distort thin margins or contours. Prompt investing and careful temperature control help preserve the accuracy of completed wax patterns before the mold is made. Correct processing prevents defects that are difficult to repair later.

38. D - Casting alloys contract as they cool from molten to room temperature. Controlled setting and thermal expansion of the investment helps offset this contraction so the casting more closely reproduces the intended dimensions. The expansion must be predictable; too much or too little can create a restoration with poor fit. Correct processing prevents defects that are difficult to repair later.

39. C - Phosphate-bonded investments are more thermally stable at elevated temperatures than gypsum-bonded investments, making them suitable for many base-metal and high-fusing alloy procedures. Investment type must be compatible with the casting temperature and alloy system to avoid mold breakdown and contamination. Correct processing prevents defects that are difficult to repair later.

40. A - Hardness describes resistance to localized surface deformation, indentation, or scratching. Ductility concerns plastic deformation in tension, solubility concerns dissolution, and translucency concerns light transmission. Knowing hardness helps technicians choose cutting, finishing, and polishing instruments appropriate for different alloys, ceramics, and polymers. Correct processing prevents defects that are difficult to repair later.

41. D - Ductility is the ability of a material to undergo plastic deformation under tensile loading before fracture. Brittle materials show limited plastic deformation, while opacity and solubility describe optical and chemical behavior. Ductility influences how wires, clasps, and other metallic components respond to bending and adjustment. Correct processing prevents defects that are difficult to repair later.

42. C - The metal substructure and veneering porcelain expand and contract during firing and cooling. Excessive mismatch can place the ceramic under unfavorable stress and contribute to cracking, debonding, or distortion. Use only material combinations designed to function together within the manufacturer's specified thermal behavior. Correct processing prevents defects that are difficult to repair later.

43. A - A controlled oxide layer on a compatible metal-ceramic alloy participates in chemical bonding with the porcelain. Too much or poorly controlled oxide can be harmful, but an appropriate oxide is part of the bonding system. Surface preparation and oxidation should follow the alloy and porcelain manufacturers' procedures rather than improvised treatment.

44. B - Polymethyl methacrylate, or PMMA, is the conventional polymer used for many denture base acrylic resins. Polyvinyl siloxane is an impression material, calcium sulfate is gypsum chemistry, and lithium disilicate is a glass-ceramic. Knowing material families prevents technicians from applying processing methods or finishing procedures intended for a different class of material.

45. B - Acrylic porosity can result when processing temperature, pressure, packing, or resin ratio is poorly controlled. Monomer vaporization or insufficient material under pressure may leave voids. Following the resin manufacturer's packing and curing cycle reduces porosity and supports strength, accuracy, and a cleansable finished surface. Correct processing prevents defects that are difficult to repair later.

46. A - Separating medium forms a barrier between gypsum and acrylic resin so the processed resin does not adhere to or absorb gypsum contamination. It also helps produce a cleaner tissue surface. Apply an even barrier to the intended gypsum surfaces without contaminating areas where bonding to acrylic components is needed. Correct processing prevents defects that are difficult to repair later.

47. C - Flux chemically reduces or prevents oxides that interfere with wetting and flow of solder across the prepared joint surfaces. Anti-flux serves the opposite boundary-control role. Clean metal, correct flux, appropriate heat, and proper joint design work together to produce a sound soldered connection. Correct processing prevents defects that are difficult to repair later.

48. D - Anti-flux is placed where solder flow is not wanted, creating a boundary that helps control the soldered area. Flux is used on surfaces where wetting and flow are desired. Using each material in its correct location improves joint control and reduces finishing of unwanted solder spread. Correct processing prevents defects that are difficult to repair later.

49. A - A wetting agent lowers surface tension and improves the ability of mixed investment to contact fine wax details. Better adaptation reduces air entrapment and surface nodules on the casting. Use the agent sparingly and according to instructions so it improves adaptation without contaminating the investment system. Correct processing prevents defects that are difficult to repair later.

50. C - Wax solvents are used to dissolve or soften wax residues so surfaces can be cleaned or prepared for subsequent procedures. They do not set gypsum, sinter ceramics, or create optical effects. Because many solvents are volatile or hazardous, technicians should use proper ventilation, storage, and manufacturer-recommended handling practices. Correct processing prevents defects that are difficult to repair later.

51. B - Diamond is extremely hard and is widely used in rotary instruments for cutting and adjusting hard ceramics, including zirconia. Pumice is a polishing abrasive for softer applications, while foil and alginate are not grinding abrasives. Instrument selection should match material hardness to control heat, surface damage, efficiency, and the amount of pressure required.

52. D - Coarser abrasives remove bulk irregularities efficiently but leave larger scratches. Progressively finer abrasives replace those scratches with smaller ones until the surface becomes smooth enough for final polishing. Skipping intermediate steps often wastes time because a very fine abrasive cannot efficiently remove deep scratches left by a coarse instrument. Correct processing prevents defects that are difficult to repair later.

53. D - Polyvinyl siloxane is an addition silicone elastomer valued for elastic recovery, fine detail, and good dimensional stability when properly handled. Plaster is rigid, modeling compound is thermoplastic, and inlay wax is not an elastomeric impression material. Stable impressions support accurate pouring or scanning when storage and disinfection follow the manufacturer's directions.

54. C - Polyether impression material has good detail and dimensional characteristics but is comparatively stiff after polymerization. That stiffness can complicate removal from deep undercuts or around mobile structures. Material selection should consider both accuracy and the geometry of the case so removal does not tear the impression or damage supporting structures.

55. B - Alginate hydrocolloid can lose water after removal from the mouth, causing dimensional shrinkage through syneresis and evaporation. It can also expand if it absorbs excess water. Prompt pouring and appropriate short-term storage help reduce dimensional change before a gypsum cast is produced. Correct processing prevents defects that are difficult to repair later.

56. A - Alginate can absorb water from its surroundings, a process called imbibition, and the resulting swelling can alter dimensions. This is the opposite direction from shrinkage caused by water loss. Control storage conditions and pour alginate promptly rather than attempting to preserve it by prolonged water immersion. Correct processing prevents defects that are difficult to repair later.

57. D - Dental zirconia is a polycrystalline ceramic used extensively for high-strength frameworks and monolithic restorations. Feldspathic porcelain is more glassy and typically lower strength, while polyether and PMMA are polymers. Processing, adjustment, polishing, and sintering requirements should be matched specifically to the zirconia system being used. Correct processing prevents defects that are difficult to repair later.

58. A - Lithium disilicate is a glass-ceramic that combines useful strength with favorable translucency and esthetic potential. Cobalt-chromium is a metal alloy, gypsum is a cast material, and polyether is an impression material. The restoration design and manufacturer recommendations determine whether lithium disilicate is appropriate for the clinical indication. Correct processing prevents defects that are difficult to repair later.

59. B - Die hardeners penetrate or coat the gypsum surface to improve resistance to abrasion and minor damage during waxing, scanning, or handling. They are not substitutes for die spacer and should not obscure preparation detail. Apply them thinly so surface protection is gained without changing critical dimensions at the margin. Correct processing prevents defects that are difficult to repair later.

60. C - Die spacer is applied to selected prepared-tooth surfaces to provide controlled internal space for cement or other luting material. It is normally kept away from the finish line so marginal adaptation remains accurate. Uniform spacer thickness supports seating while preserving a close margin and the intended internal geometry. Correct processing prevents defects that are difficult to repair later.

61. B - Film thickness describes how thin the luting material can become under seating pressure. Excessive film thickness may prevent complete seating even when the restoration itself is accurate. Laboratory internal relief and die-spacer design should accommodate the expected cement space without unnecessarily reducing retention or marginal accuracy. Correct processing prevents defects that are difficult to repair later.

62. C - A restoration cannot be designed reliably when the preparation margin is missing, torn, or obscured in the digital data. Complete opposing and bite records are useful, but they do not compensate for absent finish-line information. Validate clinically important scan areas before design so errors are not carried into manufacturing. That distinction supports accurate, predictable laboratory quality control.

63. D - A void or air bubble in the poured gypsum where it contacts the impression produces a positive nodule on the cast. Missing impression material more often creates absent or distorted anatomy, not a raised stone projection. Inspect and remove isolated nodules carefully only when the underlying impression clearly shows the intended contour.

64. A - Defects in the impression are reproduced in the master cast and can compromise margin location, contacts, fit, or tissue adaptation. Pouring a visibly defective impression only converts the error into a harder-to-detect model problem. Evaluate critical anatomy first and request a new impression when the record cannot support accurate fabrication.

65. B - A custom tray can be shaped to the arch and designed with controlled spacing, helping maintain a more uniform bulk of impression material. It does not replace material handling or guarantee a clinically acceptable impression. Tray design should support the selected material and case anatomy while allowing proper extension and seating.

66. A - The removable die must retain an undamaged finish line and surrounding anatomy so margins, contacts, and emergence can be established accurately. Aggressive sawing or trimming can remove critical data. Section with controlled cuts and verify that the die reseats precisely before using it for pattern or digital work. That distinction supports accurate, predictable laboratory quality control.

67. C - The opposing arch shows where the restoration must contact or clear the antagonist teeth. Without it, occlusal height and morphology are largely guesswork even if the prepared tooth is captured perfectly. Accurate opposing and bite records allow the technician to design function rather than relying on arbitrary contour. That distinction supports accurate, predictable laboratory quality control.

68. D - Digital scanners combine multiple captured views into a continuous surface. Poor acquisition or tracking can create stitching errors, doubled surfaces, or distorted geometry that compromises design accuracy. Review the mesh for continuity and request rescanning when artifacts involve margins, contacts, implant references, or occlusal surfaces. That distinction supports accurate, predictable laboratory quality control.

69. B - A stable base allows the cast to sit predictably on the bench and mounting system without rocking. Instability can introduce errors during articulation, surveying, scanning, or restoration adjustment. Trim for stability while preserving all anatomy and reference areas needed for the prescribed laboratory procedures. That distinction supports accurate, predictable laboratory quality control.

70. A - Disinfectants can alter dimensions or surfaces of some impression materials when concentration or exposure is inappropriate. Manufacturer instructions provide material-specific limits while infection-control procedures still must be respected. Use a compatible method and coordinate with the dental office rather than improvising exposure that may damage the record. That distinction supports accurate, predictable laboratory quality control.

71. C - The flame pictogram is used for several fire-related chemical hazards, such as flammables and certain self-reactive or pyrophoric materials. It is not a dental anatomy or process-control symbol. Read the full label and SDS because the pictogram signals a hazard class but does not replace product-specific precautions. The safest choice controls exposure before routine work continues.

72. B - Local exhaust captures airborne particles close to the point where they are generated, reducing spread through the breathing zone and laboratory. General room airflow alone is usually less effective at source control. Use engineering controls together with appropriate equipment maintenance and PPE rather than relying on respirators or cleanup alone.

73. D - Grinding can eject fragments, abrasive particles, and debris toward the eyes and face. Appropriate eye or face protection reduces injury risk and should be selected for the task. PPE is a final layer of control and should complement guards, dust collection, safe technique, and maintained equipment. The safest choice controls exposure before routine work continues.

74. C - Compressed gas stores substantial energy. If a cylinder falls and the valve is damaged, uncontrolled gas release can move the cylinder violently and cause serious injury or property damage. Secure cylinders, protect valves as required, and move them with appropriate equipment rather than dragging or rolling them casually. The safest choice controls exposure before routine work continues.

75. D - An unknown spill should be treated cautiously because the chemical may be corrosive, toxic, reactive, or flammable. Untrained cleanup can increase exposure or trigger a reaction. Restrict access, identify the material from labels or SDS information when safe, and use the established spill-response procedure. The safest choice controls exposure before routine work continues.

76. A - CDC guidance recognizes impressions and prosthetic items as potential sources of cross-contamination and recommends cleaning and disinfection before laboratory handling when status is uncertain. Routine production should not begin on a potentially contaminated item. Use PPE until decontamination is complete and follow material-compatible procedures so infection control does not distort the record.

77. A - Separating receiving and decontamination from clean production reduces the chance that microorganisms are transferred to benches, equipment, or other cases. Cross-contamination control is a workflow issue as well as a cleaning issue. Establish clear dirty-to-clean movement and avoid carrying untreated items through routine production spaces. The safest choice controls exposure before routine work continues.

78. D - Sharp laboratory items can injure anyone handling waste if discarded loose. A puncture-resistant sharps container provides controlled containment and reduces accidental sticks or cuts. Dispose of sharps at the point of use according to applicable policy rather than moving exposed sharp items through the laboratory. The safest choice controls exposure before routine work continues.

79. C - Food and drinks can pick up hazardous chemicals, dust, or biological contamination from hands, benches, or airborne particles. Consuming them in work areas creates an avoidable ingestion pathway. Use designated clean break areas and maintain separation between eating activities and spaces used for hazardous or contaminated laboratory work. The safest choice controls exposure before routine work continues.

80. B - Different glove materials resist chemicals differently, so a glove that protects against one product may degrade or permeate rapidly with another. Compatibility information from the manufacturer or SDS should guide selection. Choose gloves for the actual chemical and task, then replace them promptly if contaminated, damaged, or degraded. The safest choice controls exposure before routine work continues.

81. A - Ceramic design begins with a complete evaluation of the preparation, space, opposing dentition, contacts, and prescription. Focusing on a single administrative or cosmetic detail can miss structural limitations that determine material thickness and support. A careful diagnostic review helps the technician choose contours and layering that are both esthetic and mechanically appropriate.

82. B - Veneering ceramic performs better when the framework or core provides anatomical support and avoids large unsupported masses. Unsupported porcelain is more susceptible to tensile stress and chipping. Framework design should anticipate the final tooth form so ceramic thickness is controlled rather than used to compensate for a poorly shaped substructure.

83. C - A cutback reduces selected portions of a core or monolithic design to create room for veneering ceramic while maintaining support and intended contours. It is a design strategy, not a method for removing margins or increasing cement space. Cutback depth should respect material minimums and the planned distribution of translucent and chromatic ceramics.

84. D - Vacuum firing reduces the amount of trapped gas within many dental porcelains as particles sinter together, improving density and optical quality. It does not replace correct firing temperature or material-specific furnace programming. Use the prescribed vacuum and firing cycle because deviations can affect surface texture, translucency, fit, and structural quality.

85. C - Value describes relative lightness or darkness. A restoration that appears too bright or light generally has excessive value even if the basic hue family is close. Shade evaluation should consider hue, chroma, value, translucency, and surface texture together, because correcting one dimension may affect the visual perception of others. That distinction supports accurate, predictable laboratory quality control.

86. D - Metamerism occurs when objects with different spectral reflectance appear to match under one lighting condition but not another. It is an optical phenomenon rather than a structural ceramic defect. Evaluate shade under appropriate, consistent lighting and understand that operator, laboratory, and daylight conditions can change perceived color relationships. That distinction supports accurate, predictable laboratory quality control.

87. B - Fine surface anatomy and texture affect specular and diffuse reflection, which influences how contour, value, and naturalness are perceived. A perfectly smooth but incorrectly textured surface may appear artificial even when shade is close. Final finishing should reproduce appropriate developmental grooves and surface character without creating plaque-retentive roughness or weakening the restoration.

88. A - Rotary adjustment can leave scratches and a rough ceramic surface. Appropriate polishing reduces those defects, improving smoothness and potentially reducing abrasive interaction with opposing surfaces. Use a polishing system recommended for the ceramic rather than leaving a visibly rough adjusted area or relying on an unsuitable abrasive sequence. That distinction supports accurate, predictable laboratory quality control.

89. A - Internal characterization places color effects within the ceramic build-up rather than only on the external surface. This can help reproduce depth, mamelons, translucency, or localized chroma. Characterization should remain subtle and planned because excessive internal color is difficult to remove once additional ceramic layers are fired over it. That distinction supports accurate, predictable laboratory quality control.

90. D - Ceramics are brittle and sensitive to thermal gradients. Rapid temperature change can create uneven contraction and internal stress that promotes cracks or distortion. Follow the furnace program and manufacturer guidance for cooling, especially with thick or complex restorations where the interior and surface can cool at different rates. That distinction supports accurate, predictable laboratory quality control.

91. C - Monolithic designs place most or all functional contour in a single ceramic material, reducing reliance on a separate veneer layer. They can be useful when space is limited and strength is a priority. Material choice still depends on indication, esthetics, preparation, opposing dentition, and the manufacturer's minimum thickness requirements. That distinction supports accurate, predictable laboratory quality control.

92. B - Final acceptance should evaluate both functional and esthetic requirements. Accurate margins and contacts are as important as occlusion, contour, shade, and a properly finished surface. A restoration that looks acceptable but has a deficient margin or heavy contact is not ready for delivery, so use a systematic final inspection sequence.

93. D - Denture borders should extend into the functional vestibular areas enough to contribute to retention and stability while accommodating muscle and frenum movement. Overextension causes displacement or soreness, and underextension can reduce seal and support. Accurate impressions and careful finishing preserve functional border form rather than arbitrarily shortening or lengthening the flange.

94. C - Relief creates controlled space over areas where concentrated pressure would be undesirable, such as certain bony prominences or sensitive tissues. It is not a substitute for proper extension or impression accuracy. Relief should be selective and prescribed by anatomy and treatment design, because excessive relief can reduce support or alter adaptation.

95. A - Jaw relation records depend on bases that seat securely and repeatedly. A rocking base can shift while the record is made, transferring an incorrect vertical or horizontal relationship to the articulator. Correct the base before recording or mounting rather than attempting to compensate later through tooth adjustment. That distinction supports accurate, predictable laboratory quality control.

96. B - Occlusion rims provide adjustable reference surfaces for recording vertical and horizontal jaw relations and for communicating lip support, occlusal plane, and tooth arrangement information. They are temporary recording tools, so their value depends on stable bases and accurate transfer of the records to the articulator. That distinction supports accurate, predictable laboratory quality control.

97. B - The compensating curve contributes to balanced articulation by coordinating posterior tooth arrangement with condylar guidance, incisal guidance, and cusp form. Its purpose is functional contact, not arbitrary arch curvature. The curve should be developed as part of the complete occlusal scheme rather than adjusted independently from the other determinants of balance.

98. D - Placing posterior teeth too far away from the supporting ridge can create tipping forces when the patient chews. Positioning the occlusal load over the support zone improves stability and reduces leverage. Tooth placement must also respect tongue space, esthetics, arch form, and the selected occlusal scheme. That distinction supports accurate, predictable laboratory quality control.

99. A - Acrylic polymerization is exothermic, and thick sections can retain heat. If the temperature rises enough to vaporize monomer, internal voids may form even when the external surface looks acceptable. Use the specified curing cycle and resin ratio so heat generation remains controlled and the base polymerizes uniformly. That distinction supports accurate, predictable laboratory quality control.

100. C - The denture base, teeth, stone, and flask cool at different rates. Rapid deflasking while the materials are still hot can release stresses and allow dimensional change. Allow the flask to cool according to the processing protocol so the denture reaches a more stable condition before it is separated from the mold.

101. A - Processing can introduce small dimensional changes that alter tooth contacts even when the original setup was balanced. A laboratory remount allows those discrepancies to be identified and corrected on the articulator. Equilibration after remount should preserve the intended tooth anatomy and occlusal scheme while removing processing-related interferences. That distinction supports accurate, predictable laboratory quality control.

102. C - Simply placing repair resin over a closed fracture provides limited bulk and bonding area. Opening or beveling the fracture creates room for repair material and increases the available joining surface. The denture segments must first be accurately related so improving joint design does not lock the prosthesis into a distorted position.

103. D - A rebase replaces the denture base material while retaining the existing teeth and their established arrangement. A reline adds material mainly to the tissue surface to improve adaptation without replacing the entire base. Choosing the correct procedure depends on whether the problem is primarily base deterioration, tissue adaptation, tooth position, or occlusion.

104. B - The intaglio surface is the fitting surface that contacts the supporting tissues. Excessive polishing can remove material and change adaptation, while the external polished surface is intentionally contoured and finished for comfort and cleansability. Remove processing nodules selectively, but preserve the recorded tissue form and border geometry needed for fit and stability.

105. A - The finish line marks the boundary of the preparation and guides margin design, contour, and seating. If it is indistinct or damaged, the technician cannot reliably determine where the restoration should end. Do not invent a missing margin; request clarification or a new record when the critical preparation boundary cannot be identified.

106. B - Connected retainers must seat together, so their preparation geometry and restoration design require a compatible path of insertion. Divergent paths can prevent complete seating even if each unit fits separately. Evaluate draw early on the cast or digital design so path conflicts are resolved before investing or manufacturing the final framework.

107. C - Connectors transmit forces between retainers and pontics. Inadequate dimensions can allow flexure or fracture, while excessive bulk may compromise hygiene or anatomy. Design the connector within material-specific recommendations and available space rather than using a uniform size for every span and material. That distinction supports accurate, predictable laboratory quality control.

108. D - A pontic is the artificial tooth portion of a fixed dental prosthesis that occupies the edentulous space. Retainers attach to abutments, while records and sprues are separate laboratory elements. Pontic design must consider esthetics, occlusion, tissue relationship, cleansability, connector space, and the prescribed restorative material. That distinction supports accurate, predictable laboratory quality control.

109. A - Excessive cervical bulk can produce an unnatural emergence profile, crowd soft tissues, and make hygiene more difficult. Proper contour should transition from the preparation toward the contact and facial or lingual surface without unnecessary convexity. Evaluate contour from multiple views rather than judging the restoration only by its occlusal or incisal shape.

110. C - The casting or pressing mold reproduces the wax pattern, including its defects. Rough, open, or bulky wax margins therefore create more finishing and can compromise adaptation. Complete margin refinement before investing rather than expecting casting, pressing, or post-processing to correct an inaccurate pattern automatically. That distinction supports accurate, predictable laboratory quality control.

111. B - Rounded internal voids can result from gas entrapment or shrinkage-related porosity depending on their location and appearance. Thick sections and inadequate feeding can be especially susceptible as metal solidifies. Casting defects should be traced to sprue design, reservoir, alloy handling, mold temperature, and casting technique rather than simply polished away.

112. D - A reservoir provides a nearby supply of molten metal that can feed the casting as it contracts during solidification, reducing shrinkage porosity in critical areas. It does not define external anatomy. Reservoir effectiveness depends on its size, position, sprue geometry, and the solidification pattern of the casting and mold. That distinction supports accurate, predictable laboratory quality control.

113. A - A solder joint requires enough space for molten solder to flow by capillary action while the parts remain accurately related. A gap that is too narrow or too wide can compromise flow, strength, or alignment. Index the components securely and use the gap recommended for the alloy and solder system being used.

114. B - A proximal contact should be firm and correctly located without preventing seating. Broad aggressive grinding can flatten the emergence contour, open the contact, or damage adjacent anatomy. Mark the contact, adjust conservatively, reseat the crown fully, and recheck repeatedly until resistance and contour are appropriate. That distinction supports accurate, predictable laboratory quality control.

115. C - Marginal adaptation is a fundamental acceptance criterion. Esthetics cannot compensate for a restoration that does not seat or has an open margin on an accurate definitive die. Final inspection should be systematic so appearance does not distract from fit, contacts, occlusion, material integrity, and the details of the prescription. That distinction supports accurate, predictable laboratory quality control.

116. D - Finishing is not complete until the restoration is reevaluated for the features that may have been altered during adjustment. Fit, margins, contacts, occlusion, contour, and surface quality all affect clinical acceptability. A final check catches over-polished margins, opened contacts, high spots, and residual roughness before the case leaves the laboratory.

117. D - Tipping changes the long-axis angulation of a tooth so the crown and root move in opposite directions around a center of rotation. Translation moves crown and root in the same direction. Recognizing intended movement helps the technician understand why different springs, screws, bows, and appliance designs apply forces in different ways.

118. C - An expansion screw is an active component that separates sections of an appliance when it is turned, producing prescribed movement or arch development. Retentive clasps and solder joints have different functions. The screw must be oriented correctly in the acrylic so its direction of activation matches the intended appliance design.

119. A - The Adams clasp engages undercut areas of a tooth, commonly a molar, to retain a removable orthodontic appliance. Pontics replace teeth in fixed prostheses, rims record jaw relations, and implant analogs reproduce implant connections. Accurate clasp bending should provide retention without damaging the cast, distorting the wire, or creating unnecessary soft-tissue irritation.

120. B - A Hawley labial bow extends across the anterior teeth and can assist with retention or controlled tooth position depending on the appliance design. It does not replace the acrylic base or other active components. The bow should follow the prescribed contour and remain smooth so it functions without impinging on gingival tissues.

121. B - A helix lengthens the active wire segment, allowing more elastic deflection and a broader range of activation without using excessive space. The exact effect depends on wire diameter, alloy, and design. Loops must be formed smoothly because sharp kinks or damaged wire can concentrate stress and increase the chance of fracture.

122. D - Active components require sufficient acrylic support to resist loosening or fracture during use. Excessive bulk, however, can interfere with seating, speech, hygiene, or tissue comfort. Contour the base to support hardware and withstand function while preserving the prescribed relief, borders, and patient space. That distinction supports accurate, predictable laboratory quality control.

123. C - Scratches, sharp bends, and tool marks can act as stress concentrators in wire that is repeatedly flexed during appliance use. This can reduce fatigue resistance. Use appropriate pliers and smooth bending technique, especially at active spring areas where the wire will undergo repeated deflection. That distinction supports accurate, predictable laboratory quality control.

124. A - A bite plate adds acrylic in a region designed to change how opposing teeth contact, disclude selected teeth, or influence vertical relationships according to treatment goals. It is not a material-processing device. Its thickness and location must match the prescription because arbitrary changes can produce unintended contacts or prevent proper appliance seating.

125. D - Vacuum or pressure forming adapts a thermoplastic sheet over the dental model to reproduce tooth contours. The appliance still requires suitable material thickness, controlled heating, trimming, and finishing. A poor model or incomplete adaptation will be reproduced in the retainer, so accuracy must be established before forming begins. That distinction supports accurate, predictable laboratory quality control.

126. B - After soldering, the joint may contain excess solder, flux residue, or irregular surfaces. Finishing and polishing create a smooth contour while preserving enough joint material for strength. Inspect the joint after polishing because aggressive reduction can weaken the connection even when the surface appears smooth. That distinction supports accurate, predictable laboratory quality control.

127. C - An active component applies force where it contacts the dentition. If it targets the wrong tooth, the appliance does not match the treatment design and may create unintended movement or interference. Quality control should verify component position, activation direction, retention, acrylic finish, and seating before the appliance is released. That distinction supports accurate, predictable laboratory quality control.

128. A - A completed appliance must seat as intended, retain appropriately, and have smooth, nonirritating surfaces while active components occupy their prescribed positions. Model appearance is secondary to appliance function and safety. Use the definitive cast to check seating and identify acrylic, wire, or clasp areas that could prevent insertion or injure tissues.

129. C - Kennedy Class IV is a single anterior edentulous area that crosses the midline and lies anterior to the remaining natural teeth. Classes I and II are distal-extension patterns, while Class III is tooth bounded. Correct classification helps organize design considerations and communication, although the final framework still depends on the individual cast and prescription.

130. B - Guide planes are prepared or designed parallel surfaces that contact corresponding framework components and help control the path of insertion, stability, and reciprocation. They are not shade or processing features. Their effectiveness depends on proper location and parallelism within the overall surveyed design of the framework. That distinction supports accurate, predictable laboratory quality control.

131. A - A survey line records the greatest convexity of a tooth relative to the chosen path of insertion. Areas below it may provide usable retentive undercuts depending on clasp design. Changing cast tilt can change the survey line, so the path of insertion should be selected deliberately rather than by arbitrary cast position.

132. D - As a retentive clasp arm flexes during insertion and removal, it can apply lateral force to the abutment. A reciprocal component provides opposing contact to help neutralize that force. Clasp design should coordinate retention, reciprocation, support, bracing, and passivity when the prosthesis is fully seated. That distinction supports accurate, predictable laboratory quality control.

133. D - The major connector unites components across the arch and should function as a rigid unit. Excessive flexure allows parts of the framework to move independently, reducing support and stability. Rigidity must be achieved with appropriate material and dimensions while maintaining required tissue clearance and patient comfort. That distinction supports accurate, predictable laboratory quality control.

134. B - An occlusal rest transfers vertical forces to a prepared rest seat on an abutment and helps prevent the prosthesis from moving excessively toward the tissues. Direct retention comes from other clasp components. Rest form, location, and framework support should direct forces appropriately and preserve the intended path of insertion. That distinction supports accurate, predictable laboratory quality control.

135. C - An indirect retainer resists rotation of a distal-extension base away from the tissues around the fulcrum line. Positioning it farther from that line generally improves its mechanical leverage. It works with rests, retainers, and the major connector as part of the complete framework design rather than as an isolated component.

136. A - Finish lines establish where acrylic resin terminates against the metal framework and help create a clean, controlled transition. Their form can also contribute to resin retention and thickness. A poorly defined junction may produce thin resin, weak edges, or an irregular surface that is difficult to finish and maintain. That distinction supports accurate, predictable laboratory quality control.

137. D - Mesh and lattice provide mechanical retention for processed acrylic denture base material. If placed where metal should remain exposed and polished, they create unnecessary roughness and bulk. Framework design should clearly separate acrylic-retention zones from metal surfaces intended for tissue clearance, hygiene, or polished contact. That distinction supports accurate, predictable laboratory quality control.

138. A - The refractory cast duplicates the master cast in a material that can withstand the high temperatures involved in investing and casting the framework wax pattern. It is not delivered to the patient. Accuracy during duplication is critical because errors in the refractory cast are transferred into the final metal framework.

139. B - Distal-extension bases depend partly on compressible soft tissues, while the framework also engages teeth. An altered-cast technique can record the edentulous support area in relation to the fitted framework. The goal is improved support and adaptation, not removal of tooth support or conversion to a different prosthesis type. That distinction supports accurate, predictable laboratory quality control.

140. C - Finishing removes casting roughness and polishes exposed metal, but it must not erase the functional geometry that provides support, retention, reciprocation, or fit. Overgrinding can permanently change framework behavior. Polish selectively and repeatedly reseat the framework on the master cast so finishing improves the surface without altering the design. That distinction supports accurate, predictable laboratory quality control.

141. B - An implant analog is a laboratory replica of the implant or abutment connection placed in the cast so restorative components can be assembled in the recorded position. It does not reproduce soft tissue color or processing settings. Accurate analog position is essential because errors are transferred directly into the fit and screw-channel position of the restoration.

142. D - Splinting impression copings can increase rigidity and reduce individual coping movement while the implant positions are transferred to the cast. The technique does not replace accurate impression material or component seating. When used, the splint must be rigid and dimensionally stable so it preserves rather than distorts the recorded implant relationship.

143. A - A verification jig is fabricated on the cast and then checked clinically to determine whether the recorded implant positions agree with the mouth. Discrepancy suggests the definitive framework could misfit. Verifying the cast before manufacturing a rigid restoration can prevent costly remake and reduce the risk of forcing a misfitting framework into place.

144. C - A rigid framework that does not fit the implant positions passively may be pulled into place as screws are tightened, creating stress in components and supporting structures. Intentional rocking is not acceptable. Evaluate the fit before final completion rather than relying on screw force to overcome a discrepancy in the cast or framework.

145. C - A scan body has a known shape associated with a specific implant connection. The scanner captures that geometry so software can calculate the underlying implant position and orientation. The component must be fully seated, correctly matched to the system, and captured clearly because errors at this stage affect the entire digital design.

146. A - Emergence profile describes the cervical contour from the implant or abutment toward the visible crown through the soft-tissue zone. It influences tissue support, cleansability, esthetics, and restorative form. Design the contour to the prescribed tissue relationship rather than creating unnecessary bulk simply to mimic a natural tooth at every depth.

147. D - The screw-access channel must permit instrument access while avoiding undesirable emergence through visible or high-load areas when possible. Its location also affects the amount of restorative material surrounding the opening. Implant position, abutment design, and any angled-channel solution should be considered together before finalizing crown anatomy. That distinction supports accurate, predictable laboratory quality control.

148. B - A titanium base provides a precise manufactured connection to the implant or abutment while the coronal restoration can be fabricated from another material and bonded to it. It is system-specific. Bonding surfaces, cement space, component seating, and manufacturer instructions are critical because the connection and restoration act as a single assembly.

149. B - A resilient gingival mask reproduces the soft-tissue region around implant analogs and can be removed to inspect components. It helps the technician shape emergence contours without relying on rigid stone alone. The mask should be accurately positioned and not interfere with seating of copings, frameworks, or restorative components on the analogs.

150. C - An implant bar joins selected implant components and provides a designed surface for attachments, support, or retention of a removable overdenture. It is a prosthetic framework component, not an impression material. Bar position, cross-section, tissue clearance, path of insertion, and attachment space must be coordinated with the denture design. That distinction supports accurate, predictable laboratory quality control.

151. D - Implant systems differ in connection geometry, platform dimensions, screw design, and component tolerances. Parts that look similar may seat incompletely or engage incorrectly if they are not compatible. Verify the manufacturer, platform, connection, and component identification before fabrication rather than assuming interchangeability from appearance alone. That distinction supports accurate, predictable laboratory quality control.

152. A - Implant-supported restorations require the same careful occlusal evaluation as other prostheses, with particular attention to avoiding unnecessary high spots and interferences. The exact contact scheme follows the prescription and case. Use mounted or digital opposing records to evaluate maximum intercuspation and excursions rather than shaping the occlusion without functional reference.

153. C - Intraoral scanners build a three-dimensional surface by registering overlapping views. A controlled continuous path helps maintain tracking and reduces the risk of lost position, doubled surfaces, or stitching artifacts. If tracking is lost near critical anatomy, the operator should reacquire reliable reference areas rather than accepting a distorted mesh. Validate the data before manufacturing begins.

154. A - Margin marking tells the design software where the preparation ends and where the restoration margin should be constructed. An inaccurate line can create an open, short, overextended, or poorly contoured margin. The technician should inspect the scan closely and avoid inventing a margin where the source data are incomplete or ambiguous.

155. D - The insertion axis establishes the direction in which a restoration will seat. Evaluating it reveals preparation undercuts, draw problems, and areas where internal geometry may prevent complete seating. Axis selection should respect the actual preparation and connected-unit requirements rather than being adjusted merely to simplify the software display. Validate the data before manufacturing begins.

156. B - Milling is constrained by the physical size and shape of the cutting tools. Very sharp internal corners or narrow spaces may be inaccessible to the selected bur and can be altered during toolpath generation. Design manufacturable geometry or use an appropriate tool strategy instead of assuming the machine can reproduce infinitely small details.

157. B - Printed resin parts often require temporary supports to resist movement, anchor overhangs, and maintain geometry while layers are formed. Support location and thickness influence print success and later finishing. Place supports where they provide stability but can be removed without damaging critical margins, fitting surfaces, contacts, or detailed anatomy. Validate the data before manufacturing begins.

158. A - Vat-polymerized parts emerge with residual uncured resin on their surfaces. Controlled washing removes that material before final curing and finishing. Incomplete cleaning can leave tacky surfaces, altered dimensions, or weak contaminated areas. Follow the resin and equipment manufacturer's wash procedure because excessive solvent exposure can also affect some printed materials.

159. D - Presintered zirconia is milled in a partially densified state that is easier to machine. During sintering it densifies and shrinks by a predictable amount, so the CAM system scales the milled geometry accordingly. Use the validated material and furnace workflow because incorrect scaling or sintering parameters can produce a restoration with inaccurate final dimensions.

160. C - Nesting positions digital restorations within the usable volume of a disk or block so material can be used efficiently and the machine can access each part. Orientation also affects sprues, milling strategy, and sometimes material layering. Good nesting balances material economy with manufacturability rather than packing parts so tightly that tools or connectors cannot be placed correctly.