PRACTICE EXAM 15: CTS-D SIMULATION (110 QUESTIONS)

Time Limit: 180 minutes | Passing Score: 70%

1. The standard governing minimum display image height based on viewing task is:

A. ANSI/AVIXA A102.01

B. ANSI/AVIXA 10:2013

C. ANSI/AVIXA V201.01

D. ANSI/AVIXA V202.01

2. The standard governing audio coverage uniformity measurement is:

A. ANSI/AVIXA V202.01

B. ANSI/AVIXA A102.01

C. ANSI/AVIXA V201.01

D. ANSI/AVIXA 10:2013

3. The standard governing AV system performance verification is:

A. ANSI/AVIXA 10:2013 AVSPV

B. ANSI/AVIXA V202.01

C. ANSI/AVIXA A102.01

D. ANSI/AVIXA V201.01

4. The standard governing image system contrast ratio is:

A. ANSI/AVIXA V202.01

B. ANSI/AVIXA 10:2013

C. ANSI/AVIXA V201.01

D. ANSI/AVIXA A102.01

5. The standard governing AV system energy management is:

A. ANSI/AVIXA A102.01

B. ANSI/AVIXA V201.01

C. ANSI/AVIXA 10:2013

D. ANSI/AVIXA AVSEM

6. The standard governing AV cable labeling is:

A. AVIXA RP-38-17

B. TIA-568

C. NEC Article 300

D. NFPA 72

7. The standard governing AV design coordination with allied trades is:

A. ANSI/AVIXA 10:2013

B. ANSI/AVIXA V201.01

C. ANSI/AVIXA 2M-2010 APEx

D. ANSI/AVIXA V202.01

8. When a ceiling projector conflicts with a fire sprinkler head, the first coordination step is:

A. Relocate the projector immediately

B. Coordination meeting with GC, fire protection, and AV

C. Contact the fire marshal

D. Cancel the projector specification

9. When an AV integrator submits a product substitution request, the first evaluation step is:

A. Check pricing

B. Verify manufacturer reputation

C. Check delivery timeline

D. Verify performance compliance with specification requirements

10. The correct sequence for AV system commissioning is:

A. Infrastructure verification, functional testing, calibration, documentation

B. Documentation, functional testing, calibration

C. Calibration first, then testing

D. Functional testing only

11. When a field observation reveals a code violation during installation, the first action is:

A. Ignore and continue

B. Accept with notation

C. Document the violation and direct immediate correction

D. Defer to post-occupancy

12. The highest-priority consideration when designing AV for a hospital operating room is:

A. Equipment cost

B. Medical device compatibility and patient safety compliance

C. Display size

D. Audio quality

13. When selecting display technology for a daylight-exposed lobby, the first specification priority is:

A. Resolution

B. Aspect ratio

C. Color space

D. Brightness rating appropriate for ambient light conditions

14. The first step in AV needs assessment for any new project is:

A. Identify stakeholder use cases, operational requirements, and constraints

B. Select equipment brands

C. Determine budget

D. Choose display sizes

15. When designing a video conferencing room, the highest-priority acoustic parameter is:

A. Maximum SPL

B. Bass response

C. RT60 appropriate for AEC performance

D. Stereo imaging

16. The governing code for AV conduit fill calculations is:

A. TIA-568

B. NEC Chapter 9

C. AVIXA RP-38-17

D. NFPA 72

17. When a specification conflict exists between Division 26 and Division 27, the resolution path is:

A. Coordinated addendum resolving the conflict

B. Division 26 governs automatically

C. Division 27 governs automatically

D. Integrator decides

18. The code governing fire-rated penetration sealing is:

A. TIA-568

B. AVIXA RP-38-17

C. NEC Article 300

D. NFPA and NEC requiring UL-listed firestop assemblies

19. When an integrator claims a substitution was approved but no documentation exists, the response is:

A. Accept the integrator's claim

B. Approve retroactively

C. Require documentation of formal approval or specification-compliant installation

D. Defer to owner

20. The first coordination deliverable for AV power requirements is:

A. Verbal estimate to electrical engineer

B. AV power schedule with circuits, voltage, amperage, and receptacle types

C. Equipment list only

D. Manufacturer data sheets

21. When a commissioning test reveals SPL below specification at two positions, the first step is:

A. Investigate loudspeaker aim, DSP settings, and coverage geometry at failing positions

B. Accept partial compliance

C. Approve with notation

D. Replace loudspeakers

22. The standard governing overhead rigging safety factors in occupied spaces is:

A. NEC

B. TIA-568

C. AVIXA RP-38-17

D. ASME B30 and ANSI/NAFI standards requiring 10:1 safety factor

23. When a designer identifies that IT policy prohibits AV devices on the corporate network, the first design action is:

A. Specify dedicated AV network infrastructure separate from corporate LAN

B. Ignore IT policy

C. Use consumer Wi-Fi

D. Defer to integrator

24. The governing regulation for AV systems handling protected health information is:

A. NEC

B. NFPA

C. HIPAA

D. TIA-568

25. When specifying display mounting in a seismic zone, the governing requirement is:

A. Manufacturer mounting instructions

B. Installer preference

C. Standard toggle bolts

D. Local seismic code requiring bracing per IBC/ASCE 7

26. The first action when a punchlist item is disputed between designer and integrator is:

A. Reference the specification section defining the requirement

B. Accept the integrator's position

C. Reject without explanation

D. Defer to owner opinion

27. When a client requests "future-proof" technology, the design interpretation prioritizes:

A. Most expensive equipment

B. Infrastructure with capacity for growth and technology refresh

C. Equipment not yet released

D. Maximum feature density

28. The governing standard for assistive listening in assembly spaces is:

A. NEC

B. NFPA

C. AVIXA RP-38-17

D. ADA accessibility requirements

29. When designing AV for a courtroom, the highest-priority compliance requirement is:

A. ADA accessibility, evidence display, and recording integrity per jurisdictional requirements

B. Maximum display size

C. Premium audio quality

D. Aesthetic integration

30. The first design phase deliverable in a typical AV project is:

A. Construction documents

B. Final specifications

C. Conceptual/programming phase documentation

D. As-built drawings

31. When an architect changes ceiling height mid-design, the first AV impact assessment checks:

A. Equipment cost

B. Loudspeaker coverage, display mounting, projector throw, and microphone geometry

C. Cable lengths only

D. Rack location

32. The governing standard for network AV-over-IP multicast management is:

A. AVIXA RP-38-17

B. NEC

C. TIA-568

D. IGMP (RFC 3376) for multicast group management

33. When a mechanical engineer reports insufficient HVAC for the AV equipment room, the first response is:

A. Provide updated BTU/hr heat load schedule

B. Accept insufficient cooling

C. Reduce equipment count

D. Move equipment elsewhere

34. The code governing continuous load derating for AV circuits is:

A. TIA-568

B. AVIXA RP-38-17

C. NEC Article 210 (80% continuous derating)

D. NFPA 72

35. When a specification requires 2-year warranty and the integrator submits 1-year, the first action is:

A. Accept with notation

B. Approve with owner consent

C. Accept 1-year coverage

D. Return requesting specification-compliant warranty

36. The highest-priority coordination item between AV and lighting design is:

A. Equipment cost

B. Color temperature and CRI for camera performance

C. Fixture aesthetics

D. Switching protocols

37. When a video conferencing room has RT60 of 1.5 seconds, the first remediation priority is:

A. Acoustic treatment to reduce RT60 before AEC can function effectively

B. Increase AEC processing

C. Add more microphones

D. Increase loudspeaker volume

38. The governing requirement for AV equipment in classified government facilities is:

A. Standard commercial specification

B. Consumer equipment standards

C. Generic security practices

D. TEMPEST and federal facility security requirements

39. When specifying AV control system programming, the first documentation requirement is:

A. Code syntax

B. Manufacturer preference

C. Use-case operational scenarios defining system behavior per mode

D. Budget allocation

40. The first action when a fire alarm activates during AV system operation is:

A. AV audio mutes and emergency notification takes priority per life safety integration

B. AV continues normal operation

C. AV volume increases

D. AV displays emergency graphics only

41. When coordinating floor box locations, the first trade coordination is with:

A. Mechanical engineer

B. Electrical engineer and architect for exact placement on floor plan

C. Furniture vendor only

D. General contractor only

42. The governing standard for broadcast facility timing synchronization is:

A. NTP (RFC 5905)

B. AVIXA RP-38-17

C. TIA-568

D. IEEE 1588 PTP for sub-microsecond accuracy

43. When an owner occupies before substantial completion and reports system issues, the first investigation step is:

A. Reject the installation immediately

B. Accept owner's report at face value

C. Determine whether the issue is design deficiency or user unfamiliarity

D. Refer to warranty

44. The first evaluation criterion when reviewing a product substitution is:

A. Cost savings

B. Performance compliance with original specification requirements

C. Manufacturer reputation

D. Delivery timeline

45. When a designer discovers a structural column at the specified display location, the first coordination action is:

A. Remove the display from scope

B. Reduce display size

C. Coordinated meeting with architect and structural engineer for alternative placement

D. Accept obstructed view

46. The highest-priority network configuration for an AV-over-IP deployment is:

A. VLAN segmentation, QoS policies, and IGMP snooping

B. Maximum bandwidth only

C. Switch brand selection

D. Cable type only

47. When specifying outdoor AV equipment, the first environmental requirement is:

A. Consumer equipment rating

B. Indoor commercial rating

C. Standard mounting

D. IP rating appropriate for weather exposure and environmental conditions

48. The first step in AV system acceptance is:

A. Owner verbal approval

B. Formal verification of all AVSPV items against pass/fail criteria

C. Integrator self-certification

D. Final payment

49. When a hospital telemedicine specification is developed, the first compliance requirement is:

A. HIPAA-compliant encrypted transport with access controls and audit logging

B. Consumer video codec

C. Standard office setup

D. Budget optimization

50. The governing code for AV cable installation in plenum spaces is:

A. AVIXA RP-38-17

B. AVIXA V202.01

C. NEC Article 725/800 requiring plenum-rated (CMP) cables

D. TIA-568 only

51. When an integrator requests retainage release with open punchlist items, the recommendation is:

A. Release retainage

B. Release partial retainage

C. Defer decision

D. Withhold retainage until punchlist items are resolved and verified

52. The first consideration when specifying amplifier power for a venue is:

A. Budget

B. Required SPL at farthest listener plus headroom for the intended program material

C. Manufacturer preference

D. Rack space

53. When a specification conflict emerges between HDCP versions across divisions, the resolution is:

A. Addendum specifying the current required HDCP version

B. Ignore the conflict

C. Lower division governs

D. Integrator decides

54. The governing requirement for emergency communication integration in commercial buildings is:

A. AVIXA RP-38-17

B. TIA-568

C. NFPA 72 and local fire code for mass notification

D. No requirement

55. When designing a performing arts center with both amplified and acoustic performances, the first acoustic design priority is:

A. Maximum absorption

B. Fixed acoustic treatment

C. No acoustic design needed

D. Variable acoustic treatment supporting both performance types

56. The highest-priority specification element for a touch panel user interface is:

A. Screen resolution

B. Use-case scenarios defining user experience and operational modes

C. Manufacturer selection

D. Screen size

57. When a field observation identifies cables routed parallel to power in shared conduit, the first action is:

A. Direct immediate separation per NEC and specification requirements

B. Accept if cables are shielded

C. Note in report without action

D. Approve the arrangement

58. The governing requirement for AV accessibility in public assembly spaces is:

A. NEC

B. NFPA

C. ADA requiring assistive listening and accessible display positioning

D. No federal requirement

59. When an AV equipment room shows elevated temperature during summer, the first investigation is:

A. Equipment failure

B. Scheduling issue

C. Insufficient insulation

D. HVAC cooling capacity versus actual AV heat load with seasonal derating

60. The first coordination deliverable for AV thermal loads is:

A. Verbal estimate

B. BTU/hr schedule per room derived from equipment wattage × 3.412

C. Equipment list only

D. General category estimate

61. When specifying a video wall, the first structural coordination requirement is:

A. Wall structural capacity verification with structural engineer

B. Display selection

C. Content management

D. Cable routing

62. The governing standard for AV system color calibration in cinema environments is:

A. Rec. 709

B. Rec. 601

C. sRGB

D. DCI-P3 per SMPTE standards

63. When an integrator submits as-built drawings at closeout, the first verification is:

A. Graphic quality

B. Title block format

C. Accuracy against actual installed condition including field changes

D. File format

64. The highest-priority design consideration for a hybrid meeting room is:

A. Equivalent experience for both in-room and remote participants

B. Display size only

C. Camera resolution only

D. Audio quality only

65. When specifying a DSP for a conference room, the first processing requirement is:

A. Maximum channel count

B. AEC with appropriate tail length matching room RT60

C. Graphic EQ only

D. Compressor/limiter only

66. The governing code for isolated ground receptacles in technical AV spaces is:

A. TIA-568

B. AVIXA RP-38-17

C. NFPA 72

D. NEC Article 250 and 406 for isolated equipment grounding

67. When a client adds digital signage to the lobby mid-design, the first specification impact is:

A. Display cost only

B. Mounting hardware only

C. Network connection only

D. Display, CMS, network, content workflow, power, and mounting specifications

68. The first action when a commissioning test shows audio latency exceeding specification is:

A. Accept the measurement

B. Investigate DSP processing chain, network path, and codec latency sources

C. Replace equipment

D. Adjust specification

69. When specifying AV for a multi-building campus, the first infrastructure priority is:

A. Unified control architecture with inter-building fiber backbone

B. Individual building systems

C. Consumer equipment

D. Wireless-only connectivity

70. The governing requirement for AV rack ventilation in enclosed equipment rooms is:

A. No requirement

B. Manufacturer default

C. Mechanical coordination for supply/return air matched to AV heat load

D. Rack fans alone

71. When a designer must select between prescriptive and performance specifications, performance specification is preferred when:

A. Only one product is acceptable

B. Budget is fixed

C. Client names a specific brand

D. Multiple products may satisfy the functional requirement

72. The highest-priority coordination between AV and mechanical engineering is:

A. Equipment aesthetics

B. HVAC capacity for AV heat loads and diffuser placement for microphone compatibility

C. Conduit routing

D. Display mounting

73. When specifying AV system cybersecurity, the first requirement is:

A. Network segmentation with encrypted transport and access controls

B. Standard passwords

C. Physical locks only

D. No security needed

74. The code governing minimum conductor sizing for AV circuits is:

A. AVIXA RP-38-17

B. TIA-568

C. NFPA 72

D. NEC Table 310.16 for ampacity ratings

75. When a specification requires STI 0.70+ and commissioning shows 0.62, the first investigation is:

A. Accept the measurement

B. Approve with notation

C. Evaluate coverage uniformity, acoustic treatment, and signal-to-noise ratio at failing positions

D. Replace loudspeakers immediately

76. The first action when reviewing a control system programming submittal is:

A. Verify scenarios match specified user experience and use-case requirements

B. Review code syntax

C. Check programming budget

D. Evaluate manufacturer preference

77. When an integrator requests schedule extension due to staffing issues, the evaluation priority is:

A. Approve automatically

B. Contract terms — integrator-caused delays typically not grounds for extension

C. Reject without review

D. Defer to owner

78. The governing requirement for AV system warranty transfer at closeout is:

A. No transfer required

B. Integrator retains warranty

C. Manufacturer handles transfer

D. Specification defines warranty transfer to owner with documented coverage

79. When a pre-commissioning visit reveals incomplete network configuration, the observation report must:

A. Praise progress

B. Ignore configuration items

C. Identify incomplete configuration as commissioning prerequisite

D. Accept partial readiness

80. The first consideration when specifying lighting for a video conference room is:

A. CRI 90+ and appropriate color temperature (4000-5000 K) for camera performance

B. Dimming capability only

C. Maximum brightness

D. Fixture aesthetics

81. When selecting between HDMI, HDBaseT, and AV-over-IP for distribution, the first evaluation criterion is:

A. Equipment cost

B. Cable type preference

C. Manufacturer brand

D. Distance, bandwidth, and scalability requirements of the application

82. The governing standard for speech intelligibility measurement is:

A. NEC

B. IEC 60268-16 STI measurement methodology

C. AVIXA RP-38-17

D. TIA-568

83. When a specification calls for owner training and the integrator reduces hours by 50%, the first response is:

A. Accept reduced training

B. Approve with notation

C. Require completion of full training hours per contract

D. Defer to post-occupancy

84. The first coordination action when a new wireless microphone system is added to a dense venue is:

A. RF frequency coordination survey identifying available frequencies

B. Any frequency is acceptable

C. Manufacturer default frequencies

D. Manual trial and error

85. When specifying AV for a data center operations center, the highest-priority reliability requirement is:

A. Consumer equipment

B. Standard commercial

C. Budget optimization

D. Redundant systems with UPS/generator and mission-critical failover

86. The governing requirement for AV pathway separation from power cables is:

A. AVIXA RP-38-17

B. NEC and industry best practice for signal class separation

C. TIA-568

D. No requirement

87. When a designer specifies DHCP for production AV devices, the risk that must be addressed is:

A. IP reassignment breaking device communication

B. No risk exists

C. DHCP is always preferred

D. Network team handles this

88. The first step when reviewing an integrator's rack elevation drawings is:

A. Graphic quality

B. Equipment brand

C. Equipment placement, thermal management, weight distribution, and cable management

D. Cost verification

89. When specifying AV for a classified government briefing room, the first security requirement is:

A. Federal security compliance including TEMPEST and isolated network requirements

B. Standard commercial security

C. Consumer equipment

D. Cloud-based system

90. The governing code for AV equipment seismic bracing in high-seismic zones is:

A. AVIXA RP-38-17

B. TIA-568

C. IBC and ASCE 7 seismic design requirements

D. No code requirement

91. When a specification omits signal flow diagrams, the construction impact is:

A. No impact

B. Minor inconvenience

C. Integrator compensates

D. Installation ambiguity requiring integrator to interpret system architecture

92. The highest-priority consideration when specifying a matrix switcher is:

A. Brand preference

B. Input/output count, resolution capability, and HDCP compliance for the application

C. Physical size

D. Price point

93. When an architect changes flooring material after floor box locations are set, the first coordination action is:

A. Verify floor box trim compatibility with new flooring material

B. No action needed

C. Remove floor boxes

D. Change floor box manufacturer

94. The governing requirement for emergency audio override in commercial facilities is:

A. No requirement

B. Optional integration

C. NFPA 72 mass notification requiring priority override of non-emergency audio

D. AV designer preference

95. When specifying AV for a performing arts center, the first acoustic coordination is with:

A. Equipment vendor

B. Lighting designer

C. Interior designer

D. Acoustical consultant for RT60, coverage, and intelligibility targets

96. The first design consideration when a client describes frequent office reorganization is:

A. Fixed infrastructure

B. Flexible zoned pathways, wireless capability, and reconfigurable equipment

C. No AV investment

D. Consumer portable equipment

97. When an integrator submits firmware versions for review, the first evaluation is:

A. Current manufacturer release matched to deployment with planned maintenance

B. Always oldest stable version

C. Always latest beta version

D. Integrator preference

98. The governing requirement for AV system documentation at closeout is:

A. No documentation required

B. Manufacturer brochures only

C. Specification-defined deliverables including as-builts, programming, guides, and training records

D. Verbal summary only

99. When a post-occupancy evaluation reveals user interface complaints, the most likely root cause is:

A. Hardware failure

B. Network issue

C. Equipment defect

D. Insufficient user experience testing during design development

100. The first consideration when specifying a projector for a room with west-facing windows is:

A. Ambient light control before projector selection

B. Maximum lumens

C. Screen gain

D. Projector brand

101. When specifying AV for a hotel conference center with 30 rooms, the first management priority is:

A. Individual room design

B. Centralized control and monitoring with standardized configurations

C. Consumer equipment

D. Per-room unique systems

102. The governing code for AV system power conditioning in broadcast facilities is:

A. AVIXA RP-38-17

B. TIA-568

C. NFPA 70

D. NEC and IEEE standards for technical power and grounding

103. When a designer identifies that the specified conduit is undersized during review, the first action is:

A. Accept the conduit

B. Defer to installer

C. Issue RFI for conduit upsizing per NEC fill calculations

D. Ignore the discrepancy

104. The highest-priority consideration when specifying a 70V distributed audio system is:

A. Total tap load with appropriate amplifier headroom for reliable operation

B. Speaker aesthetics

C. Cable color

D. Amplifier brand

105. When a specification requires Delta E < 5 and measurement shows 7.2, the first action is:

A. Accept the measurement

B. Recalibrate displays to specification compliance

C. Replace displays

D. Adjust specification

106. The governing requirement for AV system IP addressing documentation is:

A. No documentation needed

B. DHCP only

C. Integrator handles addresses

D. Specification requiring IP schedule, VLAN mapping, and device naming convention

107. When an integrator requests approval to modify control programming for programmer convenience, the response is:

A. Approve modification

B. Accept programmer preference

C. Programming must match specified user experience not programmer preference

D. Defer to integrator

108. The first action when a substantial completion walk-through identifies 25 punchlist items is:

A. Document each item with specification reference and expected resolution

B. General list without detail

C. Verbal notification

D. Accept as complete

109. When specifying AV for a senior living facility, the highest-priority design consideration is:

A. Maximum features

B. Accessibility — hearing loop capability, large fonts, simplified operation

C. Premium audio

D. Advanced automation

110. The governing requirement for AV system sustainability and energy management is:

A. NEC

B. TIA-568

C. NFPA

D. ANSI/AVIXA AVSEM energy management standard

PRACTICE EXAM 15: ANSWER KEY AND EXPLANATIONS

1. D — ANSI/AVIXA V202.01 DISCAS governs image sizing based on viewing distance and task. The standard defines minimum image height calculations for Passive, Basic Decision Making, Analytical Decision Making, and Full Motion Video viewing categories. Each category uses a different divisor applied to the farthest viewing distance.

2. B — ANSI/AVIXA A102.01 governs Audio Coverage Uniformity measurement. The standard defines three ACU grades: High (±1 dB), Standard (±3 dB), and Basic (±6 dB). These grades establish measurable acceptance criteria for loudspeaker coverage consistency across listener positions.

3. A — ANSI/AVIXA 10:2013 AVSPV provides the performance verification framework. This standard establishes the methodology for systematically verifying installed AV systems against design specifications. It defines verification item lists, measurement procedures, and pass/fail criteria for acceptance testing.

4. C — ANSI/AVIXA V201.01 governs Image System Contrast Ratio. The standard defines four ISCR grades: Passive (7:1), BDM (15:1), ADM (50:1), and FMV (80:1). ISCR accounts for both display native contrast and ambient light contribution to the viewed image.

5. D — ANSI/AVIXA AVSEM governs AV system energy management. The standard defines sustainable design practices including scheduling-based power management, occupancy sensing, and standby power reduction. It provides the framework for incorporating energy efficiency into AV specifications.

6. A — AVIXA RP-38-17 governs professional AV cable labeling. The standard specifies label content, format, placement at both cable ends, and application methodology. Proper labeling enables future identification of signal type, source, and destination for long-term serviceability.

7. C — ANSI/AVIXA 2M-2010 APEx governs AV design coordination with allied trades. This standard defines the process for coordinating AV design with electrical, mechanical, structural, and architectural disciplines. It establishes the professional framework for inter-trade collaboration.

8. B — Coordination meeting with all affected trades is the first step for multi-trade conflicts. Ceiling projector versus sprinkler conflicts require input from fire protection, AV, and the general contractor to identify the best resolution. Unilateral decisions by any single trade create liability and miss optimization opportunities.

9. D — Performance compliance with specification requirements is the first substitution evaluation criterion. A substitution must meet or exceed the specified product's functional performance before cost, delivery, or manufacturer considerations are relevant. Non-compliant substitutions are rejected regardless of other factors.

10. A — Infrastructure verification, functional testing, calibration, then documentation is the proper commissioning sequence. Each phase builds on the previous: infrastructure must be complete before function can be tested, functions must work before calibration is meaningful, and documentation captures verified results. Skipping phases produces unreliable verification.

11. C — Document the violation and direct immediate correction. Code violations during installation must be recorded in the field observation report and corrected before work proceeds. Ignoring, accepting, or deferring code violations creates liability and life-safety risk.

12. B — Medical device compatibility and patient safety compliance is the highest priority. Operating room AV must comply with medical device standards, electromagnetic compatibility requirements, and patient safety regulations. Cost, display size, and audio quality are secondary to clinical compliance.

13. D — Brightness rating appropriate for ambient light conditions is the first specification priority. A daylight-exposed lobby requires 700+ nit commercial displays to maintain readability. Resolution, aspect ratio, and color space are meaningless if the display cannot overcome ambient light wash.

14. A — Identifying stakeholder use cases, requirements, and constraints begins every needs assessment. Equipment selection, budgeting, and display sizing all depend on understanding how the space will actually be used. Without defined requirements, every subsequent design decision lacks foundation.

15. C — RT60 appropriate for AEC performance is the highest-priority acoustic parameter. Acoustic echo cancellation requires manageable room reverberation to function effectively. If RT60 is too long, AEC cannot adequately cancel acoustic echo, making video conferencing unusable for remote participants.

16. B — NEC Chapter 9 governs conduit fill calculations. The code specifies maximum fill percentages based on conductor count: 53% for one, 31% for two, 40% for three or more. These limits prevent cable damage during installation and thermal issues during operation.

17. A — Coordinated addendum resolving the conflict is the proper specification resolution path. Division conflicts create ambiguity that can lead to incorrect installation. A formal addendum establishes the correct requirement and distributes it to all bidders simultaneously.

18. D — NFPA and NEC require UL-listed firestop assemblies for fire-rated penetrations. Every conduit, cable, or sleeve penetrating a fire-rated wall or floor must be sealed with a tested and listed firestop system. This is a life-safety requirement with zero tolerance for non-compliance.

19. C — Require documentation of formal approval or specification-compliant installation. Undocumented substitution claims cannot be verified. Without formal approval documentation, the integrator must provide the originally specified product or submit a proper substitution request.

20. B — AV power schedule with circuits, voltage, amperage, and receptacle types is the proper deliverable. The electrical engineer requires specific, actionable data to design branch circuits and panel schedules. Verbal estimates, equipment lists, or manufacturer sheets lack the precision needed for electrical coordination.

21. A — Investigate loudspeaker aim, DSP settings, and coverage geometry at failing positions first. Below-specification SPL at specific positions indicates a localized issue rather than system-wide failure. Diagnosis before remediation prevents unnecessary equipment changes when adjustment may resolve the issue.

22. D — ASME B30 and ANSI/NAFI standards require 10:1 safety factor for overhead loads above occupied space. This is the most stringent rigging safety requirement because failure directly threatens audience safety. Lower safety factors apply only to non-overhead or non-occupied applications.

23. A — Specify dedicated AV network infrastructure separate from corporate LAN. When IT policy prohibits AV devices on the corporate network, the design must include independent switches, cabling, and internet access for AV. This is a significant infrastructure and cost impact requiring early identification.

24. C — HIPAA governs AV systems handling protected health information. Video conferencing, recording, and display of patient data all fall under HIPAA security requirements. Encrypted transport, access controls, and audit logging are mandatory compliance elements.

25. D — Local seismic code requiring bracing per IBC/ASCE 7 governs display mounting in seismic zones. Code-mandated seismic bracing protects occupants from falling overhead equipment during earthquakes. Manufacturer instructions, installer preferences, or standard hardware don't address seismic requirements.

26. A — Reference the specification section defining the requirement resolves disputes objectively. The specification is the contractual standard against which work is measured. Specification references remove subjectivity from disputes and establish clear compliance criteria.

27. B — Infrastructure with capacity for growth and technology refresh is the professional interpretation. "Future-proof" translates to conduit with spare capacity, network headroom, and modular equipment that enables technology refresh without infrastructure reconstruction. Expensive equipment becomes obsolete; infrastructure capacity endures.

28. D — ADA accessibility requirements govern assistive listening in assembly spaces. Federal accessibility law mandates assistive listening systems in assembly spaces with fixed seating. The ADA scoping tables define minimum receiver quantities based on seating capacity.

29. A — ADA accessibility, evidence display, and recording integrity per jurisdictional requirements are the highest courtroom priorities. Courtrooms have unique legal compliance requirements including accessible evidence presentation, legally admissible recording, and ADA accommodations. These regulatory requirements supersede aesthetic or performance preferences.

30. C — Conceptual/programming phase documentation is the first design deliverable. Design begins with programming-level documents establishing use cases, room types, and system concepts. Construction documents and specifications develop later through schematic design and design development phases.

31. B — Loudspeaker coverage, display mounting, projector throw, and microphone geometry are all ceiling-height-dependent. A ceiling height change affects multiple AV parameters simultaneously. Each must be recalculated to verify continued specification compliance under the revised architectural conditions.

32. D — IGMP (RFC 3376) governs multicast group management for AV-over-IP. IGMP snooping on network switches prevents multicast traffic from flooding to unsubscribed ports. Without proper IGMP configuration, AV-over-IP deployments consume bandwidth network-wide.

33. A — Provide updated BTU/hr heat load schedule to the mechanical engineer. Data-driven coordination gives the MEP engineer the specific information needed to resize HVAC equipment. Accepting insufficient cooling, reducing equipment, or relocating are premature without first providing accurate load data.

34. C — NEC Article 210 establishes the 80% continuous derating requirement. Circuits serving continuous loads (3+ hours) must not exceed 80% of the overcurrent protection device rating. This prevents thermal accumulation that could cause conductor damage or breaker failure.

35. D — Return requesting specification-compliant warranty coverage. Specifications are contractual requirements. Accepting sub-specification warranty with notations or owner consent undermines the specification's protective purpose and leaves the owner with inadequate coverage.

36. B — Color temperature and CRI for camera performance is the highest-priority lighting coordination. Video conferencing cameras require CRI 90+ and 4000–5000 K tunable white for accurate skin tone reproduction. Incorrect lighting specification creates permanent video quality problems that cannot be corrected by AV equipment.

37. A — Acoustic treatment to reduce RT60 is the first remediation priority before AEC tuning. AEC algorithms require manageable room reverberation as their operating condition. Adding processing power or microphones to a 1.5-second room addresses symptoms rather than the root acoustic cause.

38. D — TEMPEST and federal facility security requirements govern classified government AV. These standards prevent electromagnetic emanations that could reveal classified information. Standard commercial, consumer, or generic security approaches fail federal classified facility requirements.

39. C — Use-case operational scenarios defining system behavior per mode is the first programming documentation. Scenarios tell the programmer exactly what every device does in each operational mode. Without them, programmers interpret user intent, producing interfaces that don't match actual operational needs.

40. A — AV audio mutes and emergency notification takes priority per life safety integration. Building codes require emergency messages to override all other audio during fire alarm activation. This integration prevents background music or paging from masking evacuation instructions.

41. B — Electrical engineer and architect for exact placement on floor plan is the first floor box coordination. Floor boxes installed in concrete are permanent and serve both AV and electrical needs. Exact locations coordinated on the floor plan are essential because errors cannot be corrected after concrete is poured.

42. D — IEEE 1588 PTP provides sub-microsecond synchronization for broadcast facilities. SMPTE ST 2110 and other professional media protocols require PTP's precision timing for frame-accurate stream synchronization. NTP's millisecond accuracy is three orders of magnitude insufficient.

43. C — Determine whether the issue is design deficiency or user unfamiliarity first. Early occupancy complaints may reflect untrained users operating unfamiliar systems rather than actual system failures. Proper investigation distinguishes between training needs and genuine technical deficiencies.

44. B — Performance compliance with original specification requirements is the first evaluation criterion. Substitutions must meet or exceed specified performance before any secondary factors are considered. Non-compliant substitutions fail regardless of cost savings, reputation, or delivery advantages.

45. C — Coordinated meeting with architect and structural engineer for alternative placement. Structural conflicts require collaborative resolution involving multiple disciplines. The alternative display location must satisfy viewing geometry, structural capacity, and architectural requirements simultaneously.

46. A — VLAN segmentation, QoS policies, and IGMP snooping are the first network priorities. These three configurations form the foundation of a reliable AV-over-IP network. VLANs isolate traffic, QoS ensures priority handling, and IGMP prevents multicast flooding.

47. D — IP rating appropriate for weather exposure is the first outdoor equipment requirement. Without proper environmental protection, outdoor AV equipment fails rapidly from water, humidity, temperature, and UV exposure. IP65+ ratings with corrosion-resistant hardware are mandatory before any performance specification.

48. B — Formal verification of all AVSPV items against pass/fail criteria begins acceptance. Systematic verification provides objective evidence that the installed system meets design

specifications. Owner verbal approval, integrator self-certification, or payment without verification lack the rigor required for proper acceptance.

49. A — HIPAA-compliant encrypted transport with access controls and audit logging is the first telemedicine compliance requirement. Protected health information transmitted during video consultations mandates comprehensive security per federal regulation. All other design considerations are secondary to regulatory compliance.

50. C — NEC Article 725/800 requires plenum-rated (CMP) cables in plenum spaces. Cables installed above ceilings in air-handling spaces must carry fire-retardant ratings to prevent toxic smoke during fire events. Non-rated cables create code violations and life-safety hazards.

51. D — Withhold retainage until all punchlist items are resolved and verified. Retainage is the contractual mechanism ensuring final completion. Releasing retainage with open items removes the financial incentive for the integrator to complete remaining work.

52. B — Required SPL at farthest listener plus headroom for program material is the first amplifier sizing consideration. The amplifier must deliver adequate power at the farthest seat with headroom matching the program type (10 dB speech, 15–20 dB music). Budget, manufacturer, and rack space are secondary to this performance requirement.

53. A — Addendum specifying the current required HDCP version resolves the conflict. Division conflicts create ambiguity; formal addenda establish clear requirements distributed to all parties. Ignoring conflicts, applying arbitrary precedence, or deferring to integrators perpetuates the ambiguity.

54. C — NFPA 72 and local fire code govern emergency communication in commercial buildings. Mass notification requirements mandate that emergency audio override all other building audio during alarm events. This is a code requirement, not an optional integration.

55. D — Variable acoustic treatment supporting both performance types is the first design priority. Amplified and acoustic performances require dramatically different room acoustics. Variable treatment (retractable banners, adjustable panels) enables the room to serve both without compromising either.

56. B — Use-case scenarios defining user experience and operational modes is the highest-priority touch panel specification. Without defined scenarios, the interface design is arbitrary. Screen resolution, manufacturer, and size are meaningless if the interface doesn't match how users actually operate the system.

57. A — Direct immediate separation per NEC and specification requirements. Signal and power cables sharing conduit violates NEC separation requirements and introduces electromagnetic interference. This is a code violation requiring immediate correction, not observation-only documentation.

58. C — ADA requires assistive listening and accessible display positioning in public assembly spaces. Federal accessibility law mandates these accommodations for persons with hearing and mobility limitations. This is a legal compliance requirement, not an optional design enhancement.

59. D — HVAC cooling capacity versus actual AV heat load with seasonal derating is the first investigation. Summer temperature elevation indicates the cooling system may be undersized for seasonal conditions. Updated BTU/hr calculations with seasonal factors provide the data needed for mechanical remediation.

60. B — BTU/hr schedule per room derived from equipment wattage × 3.412 is the proper thermal deliverable. Mechanical engineers require precise room-by-room heat load data to size HVAC systems. Verbal estimates, equipment lists, or general categories lack the specificity needed for proper mechanical engineering.

61. A — Wall structural capacity verification with structural engineer is the first video wall coordination. Heavy video walls create concentrated loads that standard drywall cannot support. Structural verification must occur before display selection, content planning, or cable routing.

62. D — DCI-P3 per SMPTE standards governs cinema color calibration. Digital cinema projection requires calibration to the DCI-P3 color space for accurate theatrical presentation. Rec. 709 serves HDTV, Rec. 601 serves SD, and sRGB serves computer displays.

63. C — Accuracy against actual installed condition including field changes is the first as-built verification. As-built drawings document installation reality for future service and modification. Graphic quality, title blocks, and file formats are secondary to whether the drawings accurately represent what was installed.

64. A — Equivalent experience for both in-room and remote participants is the highest hybrid room priority. Hybrid meetings must serve two audiences simultaneously with comparable engagement quality. Prioritizing only display, camera, or audio ignores the integrated nature of the hybrid experience challenge.

65. B — AEC with appropriate tail length matching room RT60 is the first DSP processing requirement. Conference rooms with loudspeakers and microphones produce acoustic echo that must be cancelled for remote participants. AEC tail length must match or exceed the room's reverberation time to effectively process all reflected energy.

66. D — NEC Article 250 and 406 govern isolated equipment grounding for technical AV spaces. Isolated ground receptacles provide separate equipment grounding paths to reduce electrical noise on sensitive AV circuits. These are identified by orange triangle markings per NEC.

67. D — Display, CMS, network, content workflow, power, and mounting specifications are all impacted. Digital signage is a complete subsystem requiring coordinated specifications across multiple trades. Addressing only one element (display, mounting, or network) leaves the remaining components unspecified.

68. B — Investigate DSP processing chain, network path, and codec latency sources first. Audio latency exceeding specification indicates accumulated delay from multiple sources. Systematic investigation of each processing stage identifies the contributor(s) before any remediation is attempted.

69. A — Unified control architecture with inter-building fiber backbone is the first campus infrastructure priority. Multi-building campuses require integrated management across buildings for operational efficiency. Individual building systems without backbone connectivity create isolated islands that cannot be centrally managed.

70. C — Mechanical coordination for supply/return air matched to AV heat load. Enclosed equipment rooms require dedicated HVAC capacity sized to the actual heat generation of installed AV equipment. Rack fans alone cannot manage heat in sealed rooms; proper mechanical engineering is required.

71. D — Performance specification is preferred when multiple products may satisfy the functional requirement. Performance specifications define measurable outcomes rather than specific products, encouraging competitive bidding. When only one product is acceptable or the client names a brand, prescriptive specification is appropriate.

72. B — HVAC capacity for AV heat loads and diffuser placement for microphone compatibility is the highest-priority mechanical coordination. Undersized cooling causes equipment failure, and poorly placed diffusers create audible noise captured by ceiling microphones. Both issues directly impact AV system performance and reliability.

73. A — Network segmentation with encrypted transport and access controls is the first cybersecurity requirement. Layered security protects AV devices from network-based attacks. Segmentation isolates AV traffic, encryption protects content, and access controls prevent unauthorized configuration changes.

74. D — NEC Table 310.16 governs conductor ampacity ratings for AV circuits. This table specifies the maximum current each wire gauge can safely carry based on insulation type and installation conditions. Using undersized conductors creates fire hazards from conductor overheating.

75. C — Evaluate coverage uniformity, acoustic treatment, and signal-to-noise ratio at failing positions. STI below target at specific positions indicates localized deficiencies. Investigation identifies whether the issue is coverage gap, excessive reverberation, or insufficient signal level before prescribing remediation.

76. A — Verify scenarios match specified user experience and use-case requirements first. Control programming must deliver the specified user experience. Code quality, budget, and manufacturer preference are secondary to whether the programming actually produces the intended operational behavior.

77. B — Contract terms typically do not grant extensions for integrator-caused delays. Staffing issues are within the integrator's control and responsibility. Professional evaluation against contract terms determines whether the claim has merit before any decision is made.

78. D — Specification defines warranty transfer to owner with documented coverage. Warranty terms, start dates, coverage scope, and transfer procedures must be clearly defined in the specification. Without these terms, ownership of warranty coverage becomes ambiguous at closeout.

79. C — Identify incomplete configuration as commissioning prerequisite requiring completion. Pre-commissioning observations must specifically document deficiencies that block verification activities. Network configuration must be complete before AV-over-IP systems can be meaningfully commissioned.

80. A — CRI 90+ and appropriate color temperature (4000–5000 K) for camera performance is the first lighting consideration. Video cameras reproduce light; incorrect color rendering or temperature creates permanent video quality problems. Dimming, brightness, and fixture aesthetics are secondary to camera-compatible light quality.

81. D — Distance, bandwidth, and scalability requirements of the application drive distribution technology selection. HDMI serves short runs, HDBaseT serves medium-distance point-to-point, and AV-over-IP serves scalable switched networks. The application's physical and bandwidth requirements determine which technology is appropriate.

82. B — IEC 60268-16 defines the STI measurement methodology for speech intelligibility. This international standard provides the measurement procedures, equipment requirements, and quality classifications for speech transmission assessment. It is the authoritative reference for STI verification in AV commissioning.

83. C — Require completion of full training hours per contract before substantial completion. Training hours are contracted deliverables essential for user adoption. Accepting reduced hours without formal scope change violates the contract and leaves users inadequately prepared.

84. A — RF frequency coordination survey identifying available frequencies is the first action. Dense venues contain numerous RF sources that occupy frequency bands. Coordination analysis maps the RF environment before any wireless microphone frequencies are assigned.

85. D — Redundant systems with UPS/generator and mission-critical failover is the highest reliability requirement. Data center operations centers support critical infrastructure monitoring that cannot tolerate interruption. Single-point-of-failure architectures risk complete operational blindness during infrastructure incidents.

86. B — NEC and industry best practice govern signal pathway separation from power cables. Electromagnetic coupling between power and signal cables introduces noise into audio and video signals. NEC separation requirements and professional AV practice establish minimum clearance distances.

87. A — IP reassignment breaking device communication is the DHCP risk requiring mitigation. Control system programming references specific IP addresses; DHCP reassignment breaks these connections. Static IP or DHCP reservation ensures consistent device addressing.

88. C — Equipment placement, thermal management, weight distribution, and cable management are the first rack elevation review priorities. Rack layouts affect system reliability through thermal management and structural stability. Graphic quality, brand verification, and cost are secondary to these functional considerations.

89. A — Federal security compliance including TEMPEST and isolated network requirements is the first classified facility requirement. Classified briefing rooms must prevent electromagnetic emanation of sensitive information and maintain complete network isolation from unclassified systems. All other design considerations flow from security compliance.

90. C — IBC and ASCE 7 seismic design requirements govern equipment bracing in high-seismic zones. These building codes mandate that overhead and rack-mounted equipment be braced to prevent failure during earthquakes. Compliance is mandatory, not optional, in designated seismic zones.

91. D — Installation ambiguity requiring integrator interpretation of system architecture. Signal flow diagrams communicate the designer's system architecture intent. Without them, integrators must guess at signal routing, connection points, and processing paths, increasing error risk.

92. B — Input/output count, resolution capability, and HDCP compliance for the application. Matrix switcher specification begins with functional requirements matching the system design. Brand, size, and price are secondary to whether the switcher handles the required signal routing.

93. A — Verify floor box trim compatibility with new flooring material first. Floor boxes installed in concrete are permanent; their trim and covers must integrate with the finished floor surface. Incompatible trim creates unsightly gaps or trip hazards at table locations.

94. C — NFPA 72 mass notification requires priority override of non-emergency audio. Code mandates that emergency notification audio take precedence over all other building audio. This is a life-safety requirement ensuring evacuation instructions are clearly audible.

95. D — Acoustical consultant for RT60, coverage, and intelligibility targets is the first coordination. Performing arts venues require specialized acoustic design that fundamentally shapes AV system performance. The acoustician's recommendations establish the acoustic environment within which the AV system must operate.

96. B — Flexible zoned pathways, wireless capability, and reconfigurable equipment for frequent reorganization. Fixed infrastructure becomes obsolete with each layout change. Zoned approaches serve areas rather than specific desk positions, accommodating reorganization without construction.

97. A — Current manufacturer release matched to deployment with planned maintenance schedule. Firmware strategy balances currency (security patches, features) with stability (tested compatibility). Neither always-latest nor always-oldest approaches serve professional deployments well.

98. C — Specification-defined deliverables including as-builts, programming, guides, and training records. Complete closeout documentation enables the owner to operate, maintain, and modify the system independently. Each document type serves a specific operational need throughout the system's lifecycle.

99. D — Insufficient user experience testing during design development is the most likely root cause. Post-occupancy UI complaints typically trace to design-phase decisions rather than hardware or network issues. UX testing during development identifies usability problems before they reach users.

100. A — Ambient light control before projector selection addresses the fundamental environmental constraint. West-facing windows produce afternoon sunlight that overwhelms any projector regardless of brightness. Specifying light control first establishes the ambient conditions within which projector selection becomes meaningful.

101. B — Centralized control and monitoring with standardized configurations is the first management priority. Thirty rooms managed individually create unsustainable operational overhead. Centralized management enables efficient monitoring, troubleshooting, and configuration across the entire conference center.

102. D — NEC and IEEE standards for technical power and grounding govern broadcast facility power conditioning. Broadcast facilities require specialized technical power systems including isolated ground, dedicated panels, and single-point grounding. These standards establish the electrical infrastructure requirements for noise-free broadcast operation.

103. C — Issue RFI for conduit upsizing per NEC fill calculations. Undersized conduit creates installation damage and code violations. The RFI formally documents the issue and requests coordination with the electrical contractor for proper conduit sizing.

104. A — Total tap load with appropriate amplifier headroom for reliable operation. The amplifier must be sized for the sum of all speaker tap settings plus 25–33% headroom. Operating at 100% capacity causes thermal stress and premature failure.

105. B — Recalibrate displays to specification compliance as the first remediation. Delta E drift beyond specification indicates calibration shift, not panel failure. Recalibration per the maintenance schedule restores color accuracy without equipment replacement.

106. D — Specification requiring IP schedule, VLAN mapping, and device naming convention. Complete IP documentation enables troubleshooting, maintenance, and future network

modifications. Without documentation, network changes become trial-and-error exercises that risk system disruption.

107. C — Programming must match specified user experience, not programmer preference. Control system programming exists to serve users, not programmers. Specification-defined scenarios establish the user experience standard that programming must deliver regardless of programmer convenience.

108. A — Document each item with specification reference and expected resolution. Specific documentation with specification references creates an actionable remediation plan. General lists, verbal notifications, or premature acceptance leave items unresolved.

109. B — Accessibility including hearing loop, large fonts, and simplified operation is the highest priority. Senior living residents may have hearing loss, reduced vision, and limited technology familiarity. Accessibility-focused design ensures all residents can use the AV system independently.

110. D — ANSI/AVIXA AVSEM energy management standard governs AV sustainability. This standard specifically addresses AV system energy efficiency including automated scheduling, occupancy-based activation, and standby power management. NEC, TIA, and NFPA serve different purposes.