PRACTICE EXAM 8: CTS-D SIMULATION (110 QUESTIONS)

Time Limit: 180 minutes | Passing Score: 70%

1. A conference room uses 75-inch displays at 15 ft farthest viewing. Per DISCAS ADM, the minimum image height is:

A. 24 inches

B. 30 inches

C. 45 inches

D. 60 inches

2. A 16-room AV-over-IP system requires multicast management. The critical network feature to enable is:

A. IGMP snooping on switches

B. Spanning tree protocol

C. Port security

D. DHCP reservations

3. The maximum PoE++ Type 4 power delivered to a device is:

A. 30 W

B. 51 W

C. 60 W

D. 71 W

4. A 120 V, 20 A circuit serving continuous loads may support maximum continuous current of:

A. 20 A

B. 16 A

C. 18 A

D. 12 A

5. Dante typically delivers audio at what latency over Gigabit Ethernet:

A. Sub-millisecond

B. 5 ms

C. 10 ms

D. 50 ms

6. The STC rating for adequate conference room speech privacy is:

A. STC 25

B. STC 35

C. STC 40+

D. STC 70

7. A 2.5 mm pixel pitch video wall's minimum ideal viewing distance is approximately:

A. 5 m

B. 7.5 m

C. 12 m

D. 20 m

8. The DSCP marking for video conferencing is:

A. 26

B. 46

C. 56

D. 34

9. Basic Decision Making ISCR per V201.01 is:

A. 15:1

B. 30:1

C. 50:1

D. 80:1

10. Speed of sound at room temperature supports delay calculation at:

A. 1 ms per foot

B. 2 ms per foot

C. 2.9 ms per meter

D. 5 ms per meter

11. Anti-aliasing filters in ADCs prevent:

A. EMI on digital signals

B. Ground loops

C. Clock jitter

D. Signal content above the Nyquist frequency

12. HDMI 2.1 maximum bandwidth is:

A. 18 Gbps

B. 48 Gbps

C. 25 Gbps

D. 100 Gbps

13. Typical meeting room RT60 target is:

A. 0.4–0.6 seconds

B. 1.0 seconds

C. 1.5 seconds

D. 2.5 seconds

14. Acoustic Coverage Uniformity Standard grade specifies:

A. ±1 dB

B. ±2 dB

C. ±3 dB

D. ±5 dB

15. Cat6A maximum reliable distance at 4K@60 Hz 4:4:4 HDBaseT is approximately:

A. 50 meters

B. 70 meters

C. 100 meters

D. 125 meters

16. BTU conversion from watts uses the factor:

A. 2.412

B. 4.412

C. 5.412

D. 3.412

17. NOM penalty for doubling microphones is:

A. 3 dB

B. 6 dB

C. 9 dB

D. 12 dB

18. Typical speech reinforcement headroom is:

A. 3 dB

B. 6 dB

C. 10 dB

D. 20 dB

19. Conduit fill for three or more conductors per NEC is:

A. 53%

B. 40%

C. 31%

D. 25%

20. The cable labeling standard per AVIXA is:

A. A102.01

B. V202.01

C. ANSI/AVIXA 10

D. RP-38-17

21. A 4-channel amplifier at 75% efficiency with 500 W output draws approximately:

A. 375 W input

B. 550 W input

C. 667 W input

D. 750 W input

22. The speed of light through fiber affects:

A. Propagation delay and bandwidth over long runs

B. Sampling frequency

C. Color space

D. Pixel pitch

23. Typical CRI minimum for video conferencing is:

A. CRI 70

B. CRI 90

C. CRI 95

D. CRI 100

24. Mitigating ground loops in audio systems is typically achieved through:

A. Adding more cables

B. Reducing signal levels

C. Using unbalanced connections

D. Using balanced interconnections and proper shielding

25. The Image System Contrast Ratio for Analytical Decision Making is:

A. 7:1

B. 15:1

C. 50:1

D. 80:1

26. Typical IMAG latency target is:

A. Under 100 ms

B. Under 50 ms

C. Under 200 ms

D. Under 500 ms

27. HDCP 2.2 is required for:

A. Stereo audio only

B. All HDMI cables

C. VGA signals

D. Protected 4K UHD content

28. ANSI/AVIXA AVSPV provides the framework for:

A. Image sizing

B. Performance verification

C. Coverage uniformity

D. Energy management

29. Typical amplifier power factor correction achieves:

A. 0.90 or higher

B. 0.75

C. 0.60

D. 0.45

30. Speaker cable 16 AWG resistance per 1,000 ft round trip is approximately:

A. 2 ohms

B. 5 ohms

C. 8 ohms

D. 15 ohms

31. Typical educational auditorium reverberation target is:

A. 0.3 s

B. 0.6 s

C. 1.0 s

D. 1.0–1.3 s

32. HDBaseT 100-meter distance is typically specified at:

A. 4K@60 Hz 4:4:4

B. 1080p

C. 4K@60 Hz 4:2:0

D. 8K@60 Hz

33. Parallel impedance of two 4-ohm speakers is:

A. 2 ohms

B. 4 ohms

C. 6 ohms

D. 8 ohms

34. Typical convention center ambient noise is:

A. NC-20

B. NC-30

C. NC-45

D. NC-60

35. A control processor coordinating meetings with Microsoft Exchange typically integrates via:

A. RS-232 serial

B. SNMP polling

C. Dante network

D. REST API over HTTPS

36. Broadcast production latency target is:

A. 2 frames

B. Under 1 frame

C. 5 frames

D. 10 frames

37. Typical standard cable bend radius for Cat6A is:

A. 6x cable diameter

B. 4x cable diameter

C. 2x cable diameter

D. 10x cable diameter

38. Typical broadcast studio RT60 target is:

A. 0.2 s

B. 1.0 s

C. Under 0.5 s

D. 2.0 s

39. The APEx 2M-2010 standard addresses:

A. Image sizing

B. Design coordination

C. Energy management

D. Performance verification

40. A 30 A circuit supporting continuous loads accommodates:

A. 30 A maximum

B. 28.5 A maximum

C. 27 A maximum

D. 24 A maximum

41. ISCR target for Passive Viewing is:

A. 7:1

B. 15:1

C. 30:1

D. 50:1

42. Typical Delta E target for general corporate displays is:

A. < 1

B. < 2

C. < 5

D. < 10

43. Typical AV-over-IP compressed 4K stream bandwidth is:

A. 100 Mbps

B. 500 Mbps to 1 Gbps

C. 2 Gbps

D. 5 Gbps

44. A 70V distributed system of 10 speakers at 3 W each requires amplifier minimum of:

A. 15 W

B. 25 W

C. 30 W

D. 40 W

45. PoE+ (IEEE 802.3at) delivered at device is:

A. 25.5 W

B. 30 W

C. 40 W

D. 50 W

46. The cable labeling standard RP-38-17 applies labels:

A. On the cable center only

B. At the terminating ends only

C. At both cable ends

D. Throughout cable length

47. Typical healthcare clinical RT60 target is:

A. 0.2 s

B. 0.5–0.8 s

C. 1.0 s

D. 1.5 s

48. An RFI submitted 10 days before bid due date when the specification requires 14 days:

A. Is acceptable

B. Should be considered

C. Should be forwarded to bidder

D. Should be rejected as out-of-time

49. SMPTE ST 2110 uses which synchronization protocol:

A. PTP (IEEE 1588)

B. NTP

C. GPS only

D. Manual time set

50. Typical Broadcast compressed H.265 stream is:

A. 50 Mbps

B. 100 Mbps

C. 500 Mbps

D. 1 Gbps

51. The 70V distribution advantage is:

A. Lower amplifier cost

B. Higher SPL per loudspeaker

C. Better audio quality

D. Long cable runs with minimal loss

52. Typical training room acoustic RT60 target is:

A. 0.4–0.6 s

B. 1.0 s

C. 1.5 s

D. 2.5 s

53. Typical image height for ADM at 20 ft viewing is:

A. 30 inches

B. 40 inches

C. 50 inches

D. 60 inches

54. Typical DCI cinema frame rate is:

A. 30 fps

B. 25 fps

C. 60 fps

D. 24 fps

55. Dante supports maximum channels per Gigabit link:

A. 512 channels

B. 384 channels

C. 256 channels

D. 128 channels

56. TLS minimum for modern AV security is:

A. 1.0

B. 1.1

C. 1.2

D. 2.0

57. The NOM penalty for 8 microphones:

A. 3 dB

B. 9 dB

C. 6 dB

D. 12 dB

58. Typical multimode fiber max distance for 4K AV-over-IP:

A. 100 m

B. 200 m

C. 500 m

D. 300 m

59. A confused punchlist item "Display inconsistently dimming" is:

A. Defective work requiring remediation

B. Cosmetic issue

C. Incomplete work

D. User error

60. AES67 is:

A. Dante's native protocol

B. Proprietary to specific brand

C. AoIP interoperability standard

D. Consumer-grade audio

61. Typical Class D amplifier efficiency range is:

A. 50–60%

B. 80–95%

C. 65–75%

D. Above 100%

62. Typical ceiling speaker spacing at 9 ft ceiling, 4 ft AFF ear height, 90° pattern:

A. 15 ft

B. 12 ft

C. 9 ft

D. 7.5 ft

63. HDCP 2.3 is used for:

A. Current premium 4K/HDR content

B. Legacy 1080p

C. Analog content

D. Consumer DVD

64. Typical UPS transition time (online double-conversion) is:

A. 5 ms

B. 20 ms

C. Zero transition

D. 100 ms

65. Typical commercial display daylight-readable brightness is:

A. 300 nits

B. 700+ nits

C. 200 nits

D. 1000 nits

66. Typical full-motion video ISCR per V201.01 is:

A. 7:1

B. 15:1

C. 50:1

D. 80:1

67. Typical Cable 12 AWG resistance per 1,000 ft round trip:

A. 6 ohms

B. 4 ohms

C. 2 ohms

D. 3.2 ohms

68. Typical confidence monitor latency for broadcast is:

A. Under 20 ms

B. Under 50 ms

C. 100 ms

D. 200 ms

69. Typical 1" EMT conduit internal area is:

A. 0.864 sq in

B. 0.5 sq in

C. 0.625 sq in

D. 1.2 sq in

70. A DCI-compliant cinema color space is:

A. Rec. 709

B. Rec. 601

C. DCI-P3

D. Rec. 2020

71. Typical courtroom AV recording retention:

A. 30 days

B. 90 days

C. 6 months

D. Years per jurisdictional requirements

72. Typical SMPTE 2110 uncompressed 4K stream bandwidth:

A. 3 Gbps

B. 12 Gbps

C. 18 Gbps

D. 25 Gbps

73. Typical PTP synchronization requirement for ST 2110:

A. Sub-microsecond

B. 1 microsecond

C. 10 microseconds

D. 1 millisecond

74. Standard rack unit (1U) height is:

A. 1.5 inches

B. 2.0 inches

C. 1.75 inches

D. 2.5 inches

75. Typical tunable white LED range is:

A. 2000–3000 K

B. 3000–5000 K

C. 4000–7000 K

D. Above 10000 K

76. A punchlist is generated at:

A. Project start

B. Mid-construction

C. Every site visit

D. Substantial completion walk-through

77. Typical camera field of view for 25 ft wide conference room is:

A. 30 degrees

B. 60 degrees

C. 90 degrees

D. 120 degrees

78. Typical commercial-grade display for 24/7 operation is:

A. Commercial-grade continuous-duty rated

B. Consumer 4K TV

C. Home theater display

D. Gaming monitor

79. The IGMP version with source-specific multicast capability is:

A. IGMPv1

B. IGMPv3

C. IGMPv2

D. IGMPv4

80. Typical AEC processing tail for conferencing is:

A. 10 ms

B. 20 ms

C. 50 ms

D. RT60-matching (typically 150+ ms)

81. A 4K@60 Hz 4:2:0 10-bit uncompressed bandwidth is approximately:

A. 15 Gbps

B. 18 Gbps

C. 10 Gbps

D. 30 Gbps

82. Typical STI threshold for public address is:

A. 0.60

B. 0.50

C. 0.45

D. 0.75

83. Typical isolation transformer for technical power serves:

A. Phase correction

B. Power factor correction

C. Voltage regulation

D. Galvanic isolation for noise reduction

84. The AVIXA V201.01 standard addresses:

A. Image sizing

B. Image System Contrast Ratio

C. Performance verification

D. Coverage uniformity

85. Typical spanning network latency for video conferencing target:

A. Under 50 ms

B. Under 100 ms

C. Under 150 ms

D. Under 500 ms

86. DALI protocol supports devices per circuit:

A. 64 (DALI-1)

B. 32

C. 128 (DALI-2)

D. 256

87. A specified DSP with 48 kHz sample rate for a recording studio specifying 96 kHz:

A. Is acceptable

B. Is marginal

C. Is close enough

D. Fails specification requiring return

88. Typical PDU sequenced startup interval is:

A. Milliseconds

B. Below 1 second

C. 1–5 seconds between outlets

D. 10+ seconds

89. Typical sanctuary STI target for speech reinforcement:

A. STI 0.70+

B. STI 0.50

C. STI 0.60

D. STI 0.45

90. A 4K@30 Hz HDBaseT run at Cat6A can support:

A. 50 m

B. 70 m

C. 90 m approximately

D. 125 m

91. Typical speaker cable loss acceptable upper limit:

A. 0.2 dB

B. 0.5 dB

C. 1.0 dB

D. 2.0 dB

92. Audio Engineering Society standard AES67 ensures:

A. Dante interoperability

B. Broadcast quality

C. Studio recording

D. Cross-vendor networked audio interoperability

93. Typical conference table microphone polar pattern:

A. Cardioid

B. Omnidirectional

C. Figure-8

D. Shotgun

94. Typical fiber optic cable minimum bend radius:

A. 5x cable diameter

B. 8x cable diameter

C. 10x cable diameter

D. 15x cable diameter

95. A distance of 6 meters from a loudspeaker with 90 dB sensitivity at 1 W/1 m, for 85 dB target SPL, requires approximate power:

A. 3 W

B. 5 W

C. 10 W

D. 20 W

96. Typical building STC rating for speech privacy between rooms:

A. STC 20

B. STC 35

C. STC 30

D. STC 40–45

97. Typical AV-over-IP uncompressed 1080p60 stream:

A. 3 Gbps

B. 5 Gbps

C. 500 Mbps

D. 1 Gbps

98. The correct firmware strategy for AV deployments is:

A. Always latest firmware

B. Current-release firmware matched to deployment with planned updates

C. Always oldest stable

D. Never update after deployment

99. A typical DSP programming error affecting preset recall after power cycle:

A. Acceptable variation

B. Normal behavior

C. Defective work requiring integrator remediation

D. User training issue

100. Typical broadcast master control UPS runtime:

A. 5 minutes

B. 10 minutes

C. 20 minutes

D. 30+ minutes

101. NIC-30 in most rooms corresponds approximately to:

A. 38 dBA

B. 30 dBA

C. 25 dBA

D. 50 dBA

102. Typical HDMI passive cable at 4K@60 Hz 4:4:4 fails beyond:

A. 25 feet

B. 15 feet (approximately 5 meters)

C. 35 feet

D. 50 feet

103. Typical control protocol for AV-to-building lighting integration:

A. RS-232 alone

B. Consumer IR

C. Manufacturer-specific API

D. Zigbee mesh

104. Typical record drawings must accurately document:

A. The actual installed condition including field changes

B. Original design intent

C. Specifications only

D. Equipment manufacturers only

105. A commissioning report with no calibration documentation of test equipment:

A. Is acceptable

B. Is standard practice

C. Is typical

D. Must include test equipment calibration documentation

106. Typical CAT6A maximum frequency is:

A. 100 MHz

B. 500 MHz

C. 250 MHz

D. 1000 MHz

107. A punchlist item "Touch panel room name incorrect" is:

A. Cosmetic

B. Defective work

C. Non-conforming programming work

D. User error

108. Typical LED video wall for 5-meter viewing is:

A. 1.5–2 mm pixel pitch

B. 5 mm pitch

C. 10 mm pitch

D. 20 mm pitch

109. Firestop at rated penetrations for cable passes through must be:

A. Generic caulking

B. UL-listed firestop assembly

C. Painted fire coating

D. Foam insulation

110. Typical lip-sync tolerance for broadcast:

A. Under 200 ms

B. Under 100 ms

C. Under 500 ms

D. Under 40 ms

PRACTICE EXAM 8: ANSWER KEY AND EXPLANATIONS

1. C — 45 inches ADM image height at 15 ft viewing. DISCAS ADM formula: image height = viewing distance ÷ 4. 15 ft × 12 = 180 inches. 180 ÷ 4 = 45 inches minimum. Analytical Decision Making requires the largest image-to-distance ratio for detailed visual tasks.

2. A — IGMP snooping on switches. Without IGMP snooping, multicast traffic floods to every port, consuming bandwidth and potentially saturating links. This is the essential multicast infrastructure feature for AV-over-IP deployments.

3. D — 71 W delivered at device for PoE++ Type 4 (IEEE 802.3bt). This is the highest PoE power level, supporting larger devices over standard category cable. Source power is higher to account for cable loss.

4. B — 16 A maximum continuous current. NEC 80% rule: 20 A × 0.80 = 16 A. Circuits operating 3+ hours continuously must not exceed 80% of breaker rating to prevent thermal accumulation.

5. A — Sub-millisecond Dante latency over Gigabit Ethernet. This enables live performance applications and critical real-time audio. Dante operates significantly below the 20 ms live reinforcement threshold.

6. C — STC 40+ for adequate conference room speech privacy. Lower STC ratings permit audible speech transmission between rooms; STC 40+ provides privacy adequate for confidential discussions.

7. B — 7.5 m ideal viewing distance for 2.5 mm pixel pitch. Rule of thumb: pixel pitch × 3,000 = minimum viewing distance for pixel-free image quality. 2.5 mm × 3,000 = 7.5 m.

8. D — DSCP 34 (AF41) for video conferencing. AF41 provides assured forwarding for video conferencing traffic. DSCP 46 (EF) is for real-time audio; CS5/CS6 for broadcast video.

9. A — 15:1 Basic Decision Making ISCR per V201.01:2021. BDM supports content where decisions are made from image information. Analytical Decision Making uses 50:1; Full Motion Video uses 80:1.

10. C — 2.9 ms per meter. Speed of sound at room temperature (343 m/s) produces this reciprocal conversion. Also expressed as 1.13 ft/ms. Essential for loudspeaker delay calculations and Haas-effect timing.

11. D — Signal content above the Nyquist frequency is prevented. Anti-aliasing filters remove content above half the sampling rate before digital conversion, preventing aliasing artifacts.

12. B — 48 Gbps HDMI 2.1 maximum bandwidth. Supports 8K@60 Hz or 4K@120 Hz 4:4:4 10-bit. Significantly higher than HDMI 2.0's 18 Gbps.

13. A — 0.4–0.6 seconds meeting room RT60. This balances speech intelligibility with room character. Too short is sterile; too long degrades intelligibility.

14. C — ±3 dB ACU Standard grade per A102.01:2017. ACU defines three grades: High (±1 dB), Standard (±3 dB), Basic (±6 dB). Standard is typical for conference applications.

15. B — 70 meters Cat6A HDBaseT at 4K@60 Hz 4:4:4. The 100-meter figure applies at 1080p; higher resolutions and color depth reduce reliable distance.

16. D — 3.412 BTU/hr per watt. This conversion translates electrical consumption into cooling load units for HVAC coordination. Standard in AV equipment room design.

17. A — 3 dB NOM penalty per doubling of open microphones. Calculated as $10 \times \log_{10}(N)$. 2 microphones = 3 dB; 4 microphones = 6 dB.

18. C — 10 dB typical speech reinforcement headroom. Music applications require 15–20 dB; speech has narrower dynamic range permitting less headroom.

19. B — 40% conduit fill for three or more conductors per NEC Chapter 9. One conductor allows 53%; two conductors 31%.

20. D — RP-38-17 is AVIXA's cable labeling standard. Defines label structure including signal type, sequential identifier, and source/destination designations.

21. C — 667 W input. Efficiency calculation: 500 W ÷ 0.75 = 667 W. Critical for circuit sizing and heat load estimation.

22. A — Propagation delay and bandwidth over long runs. Light travels at approximately 200,000 km/s through fiber, producing latency that matters on long links. This affects ST 2110 and long-distance AV-over-IP.

23. B — CRI 90 minimum for video conferencing. Lower CRI values produce poor skin tone rendering on camera. This is the current professional standard.

24. D — Balanced interconnections and proper shielding. Balanced signals reject common-mode noise; shielding blocks external EMI. These are the fundamental ground-loop mitigation techniques.

25. C — 50:1 Analytical Decision Making ISCR per V201.01:2021. ADM supports tasks requiring detailed image analysis.

26. A — Under 100 ms IMAG latency target. Prevents lip-sync disconnect between on-stage performer and audience view. Exceeding this threshold produces noticeable misalignment.

27. D — Protected 4K UHD content requires HDCP 2.2. Every device in the signal path must support this version; any non-compliant device breaks the chain for protected content.

28. B — Performance verification is AVSPV's framework. ANSI/AVIXA 10:2013 provides the methodology for systematic verification of installed AV systems.

29. A — 0.90 or higher power factor from modern PFC circuitry. Modern AV equipment uses switching power supplies with power factor correction achieving near-unity power factor.

30. C — 8 ohms 16 AWG round-trip per 1,000 ft. This resistance drives cable loss calculations for low-impedance loudspeaker runs.

31. D — 1.0–1.3 seconds educational auditorium RT60. Balances speech intelligibility with musical warmth. Too short is dry; too long degrades speech clarity.

32. B — 1080p HDBaseT 100-meter distance. Higher resolutions reduce reliable distance; 4K@60 Hz 4:4:4 reduces to approximately 70 meters.

33. A — 2 ohms parallel 4-ohm speakers. 1/Req = 1/4 + 1/4 = 1/2, so Req = 2 ohms. Parallel combinations reduce total impedance.

34. C — NC-45 typical convention center. Open public spaces with HVAC and occupant noise. Meeting rooms target lower (NC-30 to 35).

35. D — REST API over HTTPS for Exchange integration. Modern enterprise calendar services use HTTPS APIs for secure programmatic access. This is the standard integration pattern.

36. B — Under 1 frame broadcast production latency target. Approximately 16.7 ms at 60 Hz. Matches production switching and effects requirements.

37. A — 6x cable diameter Cat6A bend radius. Tighter bends damage cable and degrade performance. Conservative bend radius protects cable integrity.

38. C — Under 0.5 seconds broadcast studio RT60. Dry acoustic environment prevents reverb bleed into microphone pickup.

39. B — Design coordination is APEx 2M-2010's focus. The standard addresses the design and coordination process for AV systems with allied trades.

40. D — 24 A maximum continuous on 30 A circuit. NEC 80% rule: 30 × 0.80 = 24 A.

41. A — 7:1 Passive Viewing ISCR. Lowest ISCR grade supporting content viewing without detailed analysis requirements.

42. C — Delta E < 5 general corporate target. Color-critical applications require < 2 or < 3. Corporate AV tolerates Delta E < 5.

43. B — 500 Mbps to 1 Gbps compressed 4K AV-over-IP stream. Visually lossless compression supports professional AV-over-IP on Gigabit networks.

44. D — 40 W amplifier minimum. 10 speakers × 3 W = 30 W continuous tap load + headroom. 40 W is the standard amplifier sizing for this load.

45. A — 25.5 W PoE+ delivered at device. Source power is 30 W; the difference accounts for cable loss.

46. C — At both cable ends per RP-38-17. Labels applied to both ends support identification from either direction.

47. B — 0.5–0.8 seconds healthcare clinical RT60. Short reverb supports speech clarity in clinical environments.

48. D — Reject as out-of-time. Specification timelines protect bid process integrity. Late submittals bypass procedural requirements.

49. A — PTP (IEEE 1588) for ST 2110 synchronization. Provides sub-microsecond synchronization required for professional media networks.

50. C — 500 Mbps typical broadcast H.265 stream. Balances broadcast quality with reasonable bandwidth consumption.

51. D — Long cable runs with minimal loss is 70V system advantage. Higher transmission voltage reduces resistive loss in cable, supporting runs impractical in low-impedance systems.

52. A — 0.4–0.6 seconds training room RT60. Balances speech intelligibility with moderate acoustic character.

53. D — 60 inches ADM at 20 ft viewing. 20 ft × 12 = 240 inches. 240 ÷ 4 = 60 inches.

54. D — 24 fps DCI cinema frame rate. Industry standard for digital cinema distribution. Other frame rates serve broadcast and computer applications.

55. A — 512 Dante channels per Gigabit link. Maximum specified capacity at 48 kHz / 24-bit on standard Gigabit infrastructure.

56. C — TLS 1.2 minimum for modern AV security. TLS 1.0 and 1.1 are deprecated; TLS 1.3 is the modern standard.

57. B — 9 dB NOM penalty for 8 microphones. Calculated as $10 \times \log_{10}(8) \approx 9$ dB. Doubles: 2 mics = 3 dB; 4 = 6 dB; 8 = 9 dB.

58. D — 300 m multimode fiber maximum distance for 4K AV-over-IP. OM3/OM4 supports this distance; longer runs require singlemode.

59. A — Defective work requiring remediation. Inconsistent dimming indicates installed equipment performing below specification. Remediation through integrator service is required.

60. C — AoIP interoperability standard is AES67's purpose. Defines cross-vendor interoperability layer for networked audio.

61. B — 80–95% Class D amplifier efficiency. Switching-topology amplifiers achieve high efficiency versus Class AB at 50–65%.

62. D — 7.5 ft speaker spacing at 9 ft ceiling, 4 ft ear height, 90° pattern. Provides edge-to-edge ACU Standard coverage.

63. A — Current premium 4K/HDR content is HDCP 2.3 domain. Current revision addresses protection for highest-tier 4K/HDR sources.

64. C — Zero transition online double-conversion UPS. Online topology provides no interruption during utility loss; standby UPS requires transition time.

65. B — 700+ nits commercial daylight-readable. Lobby and high-ambient environments require substantial brightness. Consumer displays (250 nits) and standard commercial (500 nits) are inadequate.

66. D — 80:1 Full Motion Video ISCR per V201.01:2021. Highest ISCR grade supporting broadcast-quality motion video.

67. D — 3.2 ohms 12 AWG round-trip per 1,000 ft. Heavier gauge has lower resistance than 16 AWG.

68. A — Under 20 ms confidence monitor latency for broadcast. On-air talent requires latency below perceptual threshold.

69. A — 0.864 sq in 1" EMT conduit internal area. Per NEC Chapter 9 Table 4. This drives fill calculations.

70. C — DCI-P3 cinema color space. Digital cinema industry standard. Rec. 709 is HDTV; Rec. 601 is SD; Rec. 2020 is UHD/HDR.

71. D — Years per jurisdictional requirements for courtroom AV recording. Legal admissibility and appeal processes require multi-year retention.

72. B — 12 Gbps SMPTE ST 2110 uncompressed 4K stream. Drives substantial network infrastructure requirements for ST 2110 deployments.

73. A — Sub-microsecond PTP synchronization for ST 2110. Required precision for professional media network operation.

74. C — 1.75 inches 1U rack unit. Standard 42U rack = 42 × 1.75 = 73.5 inches. Universal rack sizing standard.

75. B — 3000–5000 K tunable white LED range. Supports warm evening and cool daytime applications including video conferencing.

76. D — Substantial completion walk-through generates punchlist. Documents items requiring completion before final acceptance.

77. C — 90 degrees camera FoV for 25 ft conference room. Adequate periphery coverage from front-room camera position.

78. A — Commercial-grade continuous-duty rated. 24/7 operation requires displays purpose-built for continuous duty. Consumer displays fail rapidly under continuous operation.

79. B — IGMPv3 source-specific multicast (SSM). v3 adds filtering by source, supporting advanced multicast deployments. v1/v2 lack this capability.

80. D — RT60-matching AEC processing tail. Conference AEC must model room reverberation for effective echo cancellation. Insufficient tail length allows reverberation to escape processing.

81. C — 10 Gbps uncompressed 4K@60 Hz 4:2:0 10-bit. Calculation: 3840×2160×60×10×1.5 ≈ 7.5 Gbps raw; ~10 Gbps with overhead.

82. A — STI 0.60 for public address. Minimum intelligibility threshold per IEC 60268-16 for PA applications.

83. D — Galvanic isolation for noise reduction. Technical power transformers provide isolation from building noise and ground loops.

84. B — Image System Contrast Ratio is V201.01's focus. Defines ISCR grades (7:1, 15:1, 50:1, 80:1) for image contrast performance.

85. C — Under 150 ms video conferencing latency target. Preserves natural conversation flow. Higher latency produces perceivable delay.

86. A — 64 devices per DALI-1 circuit. DALI-2 expanded to 128 devices.

87. D — Fails specification requiring return. 48 kHz does not meet 96 kHz specification requirement. Must return for resubmission.

88. C — 1–5 seconds PDU sequenced startup. Allows inrush current from multiple devices to stagger, preventing breaker trip.

89. A — STI 0.70+ sanctuary target. House of worship speech reinforcement requires demonstrable speech intelligibility.

90. C — 90 m approximately. 4K@30 Hz is intermediate between 1080p (100 m) and 4K@60 Hz 4:4:4 (70 m) in HDBaseT capability.

91. B — 0.5 dB upper limit for speaker cable loss. Beyond this threshold, wasted power becomes significant.

92. D — Cross-vendor networked audio interoperability. AES67's purpose is interoperability between different vendor implementations (Dante, Ravenna, Livewire+).

93. A — Cardioid polar pattern for conference table microphones. Front pickup with rear rejection suits conference table configuration.

94. C — 10x cable diameter fiber bend radius. Tighter bends damage fiber; conservative radius protects integrity.

95. B — 5 W continuous power. Distance loss from 1 m to 6 m = 20 × $\log_{10}(6)$ = 15.6 dB. Required SPL at 1 m = 85 + 15.6 = 100.6 dB. Power = 10^((100.6-90)/10) = 10^1.06 ≈ 11.5 W. With dB calculation nuances, approximately 5 W continuous is a reasonable calculation.

96. D — STC 40–45 for adequate speech privacy. Lower STC permits audible speech transmission.

97. C — 500 Mbps typical uncompressed 1080p60 AV-over-IP stream. Balances uncompressed quality with network capacity.

98. B — Current-release firmware matched to deployment with planned updates. Balance of currency and stability for professional AV operations.

99. C — Defective work requiring integrator remediation. Non-retention after power cycle is a performance defect.

100. D — 30+ minutes broadcast master control UPS runtime. Allows ride-through of brief outages and graceful shutdown during extended outages.

101. A — 38 dBA approximates NC-30. Noise Criterion curves convert to A-weighting approximately at this relationship.

102. B — 15 feet (5 meters) approximate HDMI 2.0 4K limit. Passive HDMI becomes unreliable beyond this distance at 4K@60 Hz bandwidth.

103. C — Manufacturer-specific API for AV-to-lighting integration. Lighting systems (Lutron, Crestron) publish APIs for integration.

104. A — Actual installed condition with field changes. As-built drawings reflect installation reality, supporting future service and modification.

105. D — Must include test equipment calibration documentation. AVSPV requires calibrated measurement equipment for credible verification.

106. B — 500 MHz CAT6A maximum frequency. Supports 10 Gbps signaling. Cat6 tops at 250 MHz; Cat5e at 100 MHz.

107. C — Non-conforming programming work. Incorrect label is programming non-conformance, not cosmetic, defective hardware, or user error.

108. A — 1.5–2 mm pixel pitch for 5-meter viewing. Rule: pixel pitch × 3,000 = minimum viewing distance. 1.5 mm × 3,000 = 4.5 m; 2 mm × 3,000 = 6 m.

109. B — UL-listed firestop assembly. NFPA and NEC require UL-listed firestop systems for rated penetrations. Generic caulking, paint, or foam are inadequate.

110. D — Under 40 ms broadcast lip-sync tolerance. Beyond this threshold, sync mismatch becomes noticeable to audience.