PRACTICE EXAM 10: CTS-I SIMULATION

QUESTIONS 1–125

Domain A — Conducting Pre-Installation Activities

1. The acronym AVIXA stands for:

A. Audio Video Industry eXchange Association

B. Audiovisual and Integrated Experience Association

C. Association for Video Installation and eXpert Accreditation

D. American Video Integration eXperience Association

2. The acronym CTS-I represents:

A. Certified Technology Specialist-Installation

B. Certified Technical Systems Integrator

C. Certified Technology Supervisor-Installer

D. Centralized Technology Systems Inspector

3. The acronym NEC in AV installation context stands for:

A. Network Electrical Certification

B. National Electronics Council

C. North American Electrical Compliance

D. National Electrical Code

4. The acronym OSHA stands for:

A. Occupational Safety and Hazards Authority

B. Official Safety Health Administration

C. Occupational Safety and Health Administration

D. Occupational Standards Health Association

5. The acronym NFPA represents:

A. Northern Fire Protection Alliance

B. National Fire Protection Association

C. National Federation of Protection Authorities

D. National Federation of Public Administrators

6. The acronym NEMA in AV installation context stands for:

A. National Electrical Manufacturers Association

B. Northeast Environmental Monitoring Association

C. National Electrical Maintenance Authority

D. Northeast Equipment Manufacturers Alliance

7. The acronym IEEE represents:

A. International Electrical Engineering Enterprise

B. Industry Electronics Engineers Exchange

C. Institute of Electrical and Electronics Engineers

D. International Engineers Electronic Exchange

8. The acronym ANSI stands for:

A. Association of National Standards Integration

B. American National Standardization Institute

C. Association National Standard Integration

D. American National Standards Institute

9. The acronym ASHRAE represents:

A. American Society of Heating, Refrigerating and Air-Conditioning Engineers

B. Association of Standardized Heating Research and Engineering

C. American Standards for Heating, Refrigeration, and Environmental Engineering

D. Association of Safe Heating, Refrigeration, and Applied Engineering

10. The acronym EMT in conduit specification stands for:

A. Electrical Main Tube

B. Electrical Metallic Tubing

C. Enclosed Metal Tubing

D. Enhanced Metal Terminal

11. The acronym RGS or RMC in raceway context refers to:

A. Roll Galvanized Steel or Rigid Metal Conduit

B. Rugged Ground Steel or Rigid Mounted Conduit

C. Reinforced Galvanized Steel or Rigid Metal Construction

D. Rigid Galvanized Steel or Rigid Metal Conduit

12. The acronym FIC in cable rating context stands for:

A. Flame-Impeding Cable

B. Fast Internal Conductor

C. Fire-Retardant Intrinsic Construction cable

D. Fiber-Integrated Channel

13. The acronym CMP in cable rating refers to:

A. Communications Multipurpose Plenum

B. Conductor Multi-Pair

C. Commercial-grade Multi-Purpose

D. Compression Multiple Pair

14. A pre-installation walk-through is conducted primarily to:

A. Document the installer's presence on the jobsite

B. Verify field conditions against project documentation

C. Collect materials from the client's storage

D. Test equipment before procurement

15. The acronym BIM in construction coordination stands for:

A. Building Integration Management

B. Budget Information Management

C. Basic Installation Manual

D. Building Information Modeling

16. The acronym MEP in construction coordination typically refers to:

A. Modern Engineering Partners

B. Multi-Engineering Projects

C. Mechanical, Electrical, and Plumbing

D. Master Electrical Plans

17. The acronym RFI in project coordination stands for:

A. Request for Information

B. Request for Installation

C. Release from Inspection

D. Report on Field Issue

18. A pre-installation site survey should document which of the following?

A. Only power and HVAC conditions

B. Power, HVAC, lighting, acoustics, network, and mounting point conditions

C. Only mounting points and access

D. Only network infrastructure

19. The acronym POE in AV networking stands for:

A. Point of Entry

B. Power over Ethernet but spelled Power of Ethernet

C. Protocol of Ethernet

D. Power over Ethernet

20. The acronym DHCP in networking stands for:

A. Domain Host Control Protocol

B. Distributed Host Communication Protocol

C. Dynamic Host Configuration Protocol

D. Digital Host Configuration Program

21. A wiring schedule primarily documents:

A. Cable sources, destinations, types, and lengths for installation

B. Electrical panel distribution for the building

C. HVAC system ductwork routing

D. Architectural wall sections and details

22. The acronym UL in safety certification represents:

A. Unified Laboratories

B. United Laboratories

C. Universal Labels

D. Underwriters Laboratories

23. The acronym IEEE 802.3 specifically governs:

A. Wi-Fi wireless networking standards

B. Ethernet physical and data link layer standards

C. Bluetooth wireless standards

D. Cellular telephony standards

24. The acronym IEEE 802.11 specifically governs:

A. Ethernet standards over copper cabling

B. Power over Ethernet standards

C. Wi-Fi wireless networking standards

D. Fiber optic cabling standards

25. NEC fill limits permit three or more cables in a conduit to occupy what maximum percentage of the conduit internal cross-sectional area?

A. 40%

B. 31%

C. 53%

D. 25%

26. The acronym XLR in audio connector nomenclature originated from:

A. An abbreviation meaning Cross-Linked Resistor

B. A term meaning Extended Line Receiver

C. A Cannon Connector model designation for a specific pin count and shell design

D. An abbreviation meaning eXtended Line-level Recorder

27. The acronym SMPTE stands for:

A. Society for Modern Production Technology Experts

B. Society of Motion Picture and Television Engineers

C. Standard Media Production Terminology Exchange

D. Society for Media Production Technology Evaluation

28. The AVIXA Code of Ethics and Conduct primarily requires credential holders to maintain:

A. Honesty, confidentiality, competence, and respect for intellectual property

B. Continuous employment in the AV industry

C. Active membership in AVIXA

D. Minimum annual income thresholds

29. The acronym HDMI represents:

A. High-Definition Media Interface

B. High-Density Media Integration

C. Home Direct Media Input

D. High-Definition Multimedia Interface

30. The acronym HDCP stands for:

A. High-Definition Content Processing

B. Home Digital Copy Protection

C. High-bandwidth Digital Content Protection

D. High-Density Content Preservation

Domain B — Conducting Site Rough-In/First-Fix

31. The acronym PPE in jobsite safety refers to:

A. Project Protection Equipment

B. Personal Protective Equipment

C. Primary Protection Enhancement

D. Professional Performance Equipment

32. Personal Protective Equipment (PPE) commonly required on AV installation jobsites typically includes:

A. Hard hat, safety glasses, gloves, and appropriate footwear

B. Only hard hats for overhead hazard protection

C. Only safety glasses for vision protection

D. Only gloves for hand protection

33. The 4-to-1 rule for extension ladder positioning establishes:

A. The ladder rungs at 4-inch intervals

B. The ladder 4 feet longer than working height

C. The ladder at 4 degrees from vertical

D. The base extends 1 foot per 4 feet of working height

34. Structural blocking for wall-mounted AV equipment should be installed by:

A. The AV installer during mounting

B. The drywall contractor during finishing

C. The general contractor or framing trade during construction

D. The electrical contractor during rough-in

35. OSHA fall protection standards for construction work require fall protection at:

A. 6 feet or greater

B. 4 feet or greater

C. 8 feet or greater

D. 10 feet or greater

36. OSHA fall arrest anchor points must have minimum rated capacity of:

A. 2,500 pounds per worker

B. 5,000 pounds per worker

C. 3,500 pounds per worker

D. 1,000 pounds per worker

37. A worker on a scissor lift platform with full-perimeter guardrails is:

A. Required to wear personal fall arrest at all heights

B. Required to have a spotter on the ground

C. Required to wear personal fall arrest above 20 feet only

D. Provided sufficient passive fall protection by the guardrails

38. A worker on a boom lift platform requires personal fall arrest attached to:

A. The ground-level fall arrest system

B. An adjacent structure within reach

C. A designated anchor on the platform

D. The floor of the platform itself

39. Concrete masonry walls require which fastener type for AV equipment mounting?

A. Wood lag bolts threaded into masonry

B. Concrete-rated wedge anchors or sleeve anchors

C. Plastic expansion anchors

D. Sheet metal screws

40. The minimum bend radius during cable installation per manufacturer specifications is typically:

A. 4 times the cable diameter

B. 2 times the cable diameter

C. 6 times the cable diameter

D. 8 times the cable diameter

41. NEC limits cumulative bend angle in conduit between pull points to:

A. 180 degrees

B. 270 degrees

C. 450 degrees

D. 360 degrees

42. The jam ratio in cable pulling is:

A. The ratio of pulling tension to cable maximum

B. The ratio of conduit internal diameter to cable outside diameter

C. The ratio of cable count to conduit fill

D. The ratio of conduit length to pull distance

Domain C — Installing Audiovisual Systems

43. The standardized vertical unit of measure for equipment racks is:

A. 1.75 inches per rack unit

B. 1.5 inches per rack unit

C. 2.0 inches per rack unit

D. 1.625 inches per rack unit

44. The standard rack mounting width is:

A. 17 inches

B. 18 inches

C. 19 inches

D. 21 inches

45. A 10U rack-mount device occupies how many inches of vertical mounting height?

A. 15 inches

B. 20 inches

C. 12 inches

D. 17.5 inches

46. The 80% rule applied to continuous loads means a 20-ampere circuit is limited to:

A. 20 amperes continuous load

B. 16 amperes continuous load

C. 18 amperes continuous load

D. 14 amperes continuous load

47. Converting watts to BTU/hour uses the multiplier:

A. 3.412

B. 2.541

C. 4.182

D. 5.675

48. The XLR connector assigns Pin 1 to:

A. Hot/positive signal

B. Cold/negative signal

C. Ground/shield

D. Phantom power return

49. Phantom power for condenser microphones is standardized at:

A. 24 volts DC

B. 48 volts DC

C. 12 volts DC

D. 36 volts DC

50. A balanced audio cable uses:

A. One conductor plus shield

B. Three conductors plus shield

C. Four conductors plus shield

D. Two conductors plus shield

51. The decibel formula for power ratios uses multiplier:

A. 20

B. 10

C. 15

D. 5

52. A 3 dB increase in audio power represents:

A. A tenfold power increase

B. A tripling of power

C. A halving of power

D. A doubling of power

53. A 70V distributed audio amplifier rated at 250 watts should drive total tap loads of approximately:

A. 250 watts

B. 300 watts

C. 200 watts

D. 175 watts

54. The transformer at each loudspeaker on a 70V distributed audio system:

A. Steps down the high-voltage line to the loudspeaker's voltage

B. Provides phantom power

C. Converts AC to DC

D. Boosts signal for long runs

55. Cat6A cable supports maximum frequency of:

A. 100 MHz

B. 250 MHz

C. 350 MHz

D. 500 MHz

56. Cat6 cable supports maximum frequency of:

A. 100 MHz

B. 250 MHz

C. 350 MHz

D. 500 MHz

57. The maximum permissible untwist at Cat6A cable termination is:

A. 0.25 inches

B. 0.75 inches

C. 0.5 inches

D. 1.0 inches

58. 75-ohm coaxial cable is typically used for:

A. Video signal transport including SDI and CATV

B. Communications RF including two-way radio

C. Speaker-level audio

D. RS-232 serial control

59. The maximum HDBaseT 4K60 copper cable distance is approximately:

A. 50 meters

B. 75 meters

C. 200 meters

D. 100 meters

60. EDID information is exchanged between source and display through:

A. A separate management network

B. The DDC channel embedded within the HDMI or DisplayPort cable

C. Manual configuration at both ends

D. RS-232 serial connection

61. HDCP 2.2 encryption is required for:

A. Audio content over Dante networks

B. 1080p content from any source

C. 4K UHD content from compatible sources

D. Standard-definition video over coaxial cable

62. OM3 multimode fiber supports 10 Gbps Ethernet to:

A. 300 meters

B. 100 meters

C. 200 meters

D. 400 meters

63. APC fiber connectors are color-coded:

A. Blue

B. Beige

C. Yellow

D. Green

64. Dante audio networking typical latency is:

A. 50 to 100 milliseconds

B. 0.25 to 1 millisecond

C. 5 to 10 milliseconds

D. 10 to 20 milliseconds

65. SDVoE distributes uncompressed 4K60 video over which minimum network?

A. 1 Gbps Ethernet

B. 100 Mbps Ethernet

C. 10 Gbps Ethernet

D. Wireless 802.11ac

66. IEEE 802.3at provides power at the powered device of:

A. 25.5 watts

B. 51 watts

C. 12.95 watts

D. 71 watts

67. An IPv4 /24 subnet provides:

A. 256 usable hosts

B. 128 usable hosts

C. 126 usable hosts

D. 254 usable hosts

68. RFC 1918 defines private IPv4 ranges including:

A. Only 192.168.0.0/16

B. 10.0.0.0/8, 172.16.0.0/12, and 192.168.0.0/16

C. Only 10.0.0.0/8

D. Only 172.16.0.0/12

69. RS-232 typical baud rates range between:

A. 1200 and 4800 bps

B. 4800 and 9600 bps

C. 9600 and 115200 bps

D. 250000 and 500000 bps

70. RS-232 configuration requires matching:

A. Baud rate, data bits, parity, stop bits

B. IP address, subnet mask, gateway

C. MAC address and VLAN

D. Frequency, modulation, encryption

71. IR control of AV equipment is generally:

A. Bidirectional with status feedback

B. Effective at 500 feet

C. Compatible with all equipment

D. Unidirectional with no status feedback

72. A control processor sending IP commands with no response should first:

A. Reboot the processor

B. Verify network connectivity using ping

C. Replace the network cable

D. Update device firmware

73. An 8-ohm loudspeaker with cable resistance limited to 5% of impedance has maximum cable resistance of:

A. 0.10 ohms

B. 0.20 ohms

C. 0.40 ohms

D. 0.50 ohms

74. Three 8-ohm loudspeakers in parallel present combined impedance of:

A. 2.67 ohms

B. 4 ohms

C. 8 ohms

D. 24 ohms

75. Digital signals degrading over distance exhibit:

A. Gradual quality degradation

B. Full quality until catastrophic failure at the digital cliff

C. Increasing color saturation

D. Audible noise

76. A waveform monitor displays:

A. Video chrominance

B. Audio levels

C. Network bandwidth

D. Video signal amplitude over time

77. A vectorscope displays:

A. Video chrominance on a polar plot

B. Video signal amplitude over time

C. Audio frequency response

D. Network packet loss

78. A projector with throw ratio 1.5:1 at 15 feet distance produces what image width?

A. 22.5 feet

B. 18 feet

C. 10 feet

D. 7.5 feet

79. The target white point for video calibration is:

A. 5500K

B. 6500K

C. 7500K

D. 9300K

80. The target gamma for standard video is:

A. 1.8

B. 2.0

C. 2.4

D. 2.2

81. AVIXA DISCAS basic decision-making content maximum viewing distance:

A. 8 times image height

B. 4 times image height

C. 12 times image height

D. 6 times image height

82. A measurement microphone should have:

A. Cardioid pattern with extended bass

B. Hypercardioid pattern

C. Flat response with omnidirectional pattern

D. Ribbon transducer

83. AES67 primarily provides:

A. Audio encryption

B. Power delivery

C. Frequency analysis

D. Open interoperability between manufacturers' networked audio systems

84. A polarity tester confirms:

A. Amplifier output voltage

B. All loudspeakers move in the same direction on the same signal

C. Audio signal level

D. Cable shielding

85. Cable certification for Cat6A tests:

A. Insertion loss, return loss, NEXT, ANEXT, propagation delay, and other parametric measurements

B. Length and continuity only

C. Voltage drop

D. Visual inspection

86. 1080p60 at 8-bit color requires approximately:

A. 3.0 Gbps

B. 6.0 Gbps

C. 9.0 Gbps

D. 4.5 Gbps

87. 4K60 at 10-bit color with HDR requires approximately:

A. 12 Gbps

B. 24 Gbps

C. 18 Gbps

D. 36 Gbps

88. A 70V system with 10 loudspeakers at 15-watt taps and 4 loudspeakers at 20-watt taps has total tap load of:

A. 200 watts

B. 210 watts

C. 230 watts

D. 250 watts

Domain D — Perform Systems Close-Out

89. ANSI/AVIXA 10:2013 structures verification items into three categories:

A. A-Level, B-Level, C-Level representing essential, specialized, and unique items

B. Level 1, Level 2, Level 3 with difficulty ratings

C. Primary, Secondary, Tertiary with sequence designations

D. Critical, Important, Optional with priority rankings

90. A non-functional system power switch is classified as:

A. A cosmetic deficiency

B. A pre-existing condition

C. A user training issue

D. A substantive deficiency affecting system function

91. Substantial completion is the milestone at which:

A. All punch list items are complete

B. The system is ready for its intended use and warranty typically begins

C. Final retention is released

D. The contract begins

92. A 12-month warranty typically begins at:

A. Contract signing

B. Equipment delivery

C. Substantial completion when the client takes beneficial use

D. First day of installation

93. As-built documentation records:

A. The installed system's actual configuration for future reference

B. Original design intent

C. Contract scope

D. Change order history

94. A typical end-user training session is characterized by:

A. Extended technical sessions

B. Lecture-style presentation

C. Self-paced video training

D. Brief focused sessions on essential operations with hands-on practice

95. A quick reference guide should include:

A. Detailed technical specifications

B. Essential functions with screenshots and simple instructions

C. Complete signal flow diagrams

D. Manufacturer service information

96. A service agreement typically provides:

A. Complete upgrades at no additional cost

B. Free equipment replacement

C. Defined response times, scheduled preventive maintenance, and priority service

D. Warranty extension on all equipment

97. A typical preventive maintenance schedule recommends:

A. Annual visits with more frequent visits for high-use environments

B. Monthly visits regardless of usage

C. Quarterly visits universally

D. Visits only when problems occur

98. Signed sign-off documentation creates:

A. Tax depreciation documentation

B. Warranty registration authorization

C. A trigger for next construction phase

D. A formal written record of client acceptance

99. A walk-through during substantial completion involves:

A. Only the lead installer

B. The installer, client representative, and sometimes the general contractor

C. Only the design engineer

D. Only the client's facility staff

100. A certificate of substantial completion documents:

A. Original equipment costs

B. Serial numbers

C. That the system is ready for use even though minor work may remain

D. Service life expectations

101. A client representative signing project completion documents typically holds:

A. Formal signing authority for the client organization

B. Limited informal authority

C. Authority to verify date only

D. Authority to modify contract terms

102. Project closeout deliverables typically include:

A. Only equipment manuals

B. Only as-built drawings

C. As-built drawings, equipment manuals, warranty documentation, and verification reports

D. Only warranty cards

Domain E — Conducting Ongoing Project Responsibilities

103. Daily progress reports primarily:

A. Calculate weekly invoices

B. Document activities, labor, materials, and issues for the project record

C. Document equipment serial numbers

D. Track individual installer productivity

104. An RFI is most appropriately used to:

A. Document materials consumed

B. Request labor resources

C. Submit invoices

D. Obtain clarification from the design team

105. Substituting equivalent accessories during installation is typically:

A. A minor adaptation within installer authority but requiring documentation

B. A code violation requiring inspector notification

C. A breach of contract

D. A major adaptation requiring change order

106. Trade coordination is primarily managed through:

A. The client's facilities director

B. Direct communication between trades without supervisors

C. The general contractor's superintendent and coordination meetings

D. The architect providing schedule updates

107. A change order is required when:

A. Materials are consumed faster than estimated

B. Work scope expands beyond original contract specifications

C. Work occurs during evening hours

D. Equipment fails during installation

108. "Clean as you go" practice means:

A. Weekly cleanup sweeps

B. Specialized cleaning contractors handle everything

C. Cleanup deferred to close-out

D. Cable scraps, packaging, and debris managed continuously

109. Construction debris is typically disposed of through:

A. The general contractor's construction waste management system

B. The AV firm's own dumpster

C. Client's regular building trash

D. Personal disposal

110. A delay caused by another trade should be reported through:

A. Direct confrontation with the other trade

B. Social media platforms

C. The project manager who can coordinate response

D. Formal grievance to building owner

111. OSHA silica controls during concrete cutting include:

A. Standard N95 dust masks

B. Water suppression, local exhaust ventilation, or respiratory protection

C. Outdoor work only

D. Carbide blade replacement

112. BIM coordination drawings primarily support:

A. Marketing presentations

B. Building permits

C. Insurance documentation

D. Conflict identification between MEP, fire protection, and technology systems

113. Discovering an unexpected condition affecting original design requires:

A. Reporting through appropriate channels for engineering review

B. Modifying installation without notification

C. Waiting for design team's next visit

D. Documenting only for as-builts

114. Reporting a delay to the project manager should occur:

A. Only after missed milestone

B. At next coordination meeting only

C. As soon as potential delay identified, even if impact uncertain

D. Only when cause is definitively determined

115. A scope change during installation should:

A. Be implemented immediately

B. Be routed through the project manager for change order processing

C. Be ignored if small

D. Be assigned without documentation

116. Work beyond original scope without change order approval typically results in:

A. Premium reimbursement rates

B. Automatic invoice addition

C. Default client acceptance at original rates

D. Labor and materials consumed without compensation

117. Documentation of field engineering decisions supports:

A. Both as-built records and traceability of decisions under installer authority

B. Sales discussions

C. Manufacturer communication

D. Performance reviews

118. The installer's firestopping responsibility is to:

A. Defer to the general contractor

B. Apply silicone caulk as temporary measure

C. Either perform firestopping correctly or coordinate with the firestop contractor

D. Use same material regardless of wall rating

119. Discovering asbestos-containing material requires:

A. Continuing with respiratory protection

B. Stopping work immediately and contacting qualified asbestos abatement personnel

C. Capping cable ends

D. Notifying only the client

120. Root-cause analysis after service incident:

A. Determines crew responsibility

B. Documents for legal proceedings

C. Calculates warranty coverage

D. Understands why the failure occurred so it does not recur

121. A typical AV installation service life is approximately:

A. 7 to 10 years

B. 2 to 3 years

C. 15 to 20 years

D. 25 to 30 years

122. End-of-life indicators include:

A. Increased user satisfaction

B. Decreased preventive maintenance

C. Increasing service frequency, declining reliability, parts unavailability

D. Reduced electricity consumption

123. Decommissioned equipment with configuration data should be:

A. Returned to manufacturer

B. Factory-reset or data-wiped before leaving the client's site

C. Donated without modification

D. Stored in client's facility

124. RoHS primarily addresses:

A. Workplace safety

B. Building codes

C. Warranty terms

D. Restricted materials in electronic equipment requiring responsible handling

125. The installer-installation relationship typically extends:

A. Through the entire service life via maintenance and service

B. Only through client handover

C. Through manufacturer warranty only

D. Until next management election

PRACTICE EXAM 10: ANSWER KEY WITH FULL ANSWER EXPLANATIONS

Questions 1–125

Domain A — Conducting Pre-Installation Activities

1. B — Audiovisual and Integrated Experience Association. AVIXA is the industry trade association that maintains the CTS credential family and publishes AV industry standards. The organization was renamed from InfoComm International to AVIXA in 2017 to reflect its broader scope in integrated experience design.

2. A — Certified Technology Specialist-Installation. The CTS-I credential specifically certifies AV professionals in installation-focused competencies, distinguished from CTS (general) and CTS-D (design). This credential recognizes specialized expertise in the physical installation of AV systems.

3. D — National Electrical Code. The NEC (formally NFPA 70) is the primary code governing electrical and low-voltage installations in the United States. Articles 725, 770, and 800 are especially relevant to AV installers working with communications circuits and fiber optic cables.

4. C — Occupational Safety and Health Administration. OSHA is the federal agency that establishes and enforces workplace safety standards. OSHA standards under 29 CFR 1910 (general industry) and 1926 (construction) govern AV installation safety.

5. B — National Fire Protection Association. The NFPA publishes NFPA 70 (the National Electrical Code) along with many other fire and life-safety standards that affect AV installation work, particularly around cable ratings and fire-stopping requirements.

6. A — National Electrical Manufacturers Association. NEMA establishes standards for electrical products including enclosures, motor controls, and wiring devices. NEMA enclosure ratings appear on electrical equipment used in AV installations.

7. C — Institute of Electrical and Electronics Engineers. IEEE is the primary standards organization for electrical and electronics engineering, publishing standards including IEEE 802.3 (Ethernet) and IEEE 802.11 (Wi-Fi) that are fundamental to AV networking.

8. D — American National Standards Institute. ANSI accredits and coordinates U.S. voluntary standards, often co-publishing standards with other organizations such as ANSI/AVIXA 10:2013 for AV performance verification.

9. A — American Society of Heating, Refrigerating and Air-Conditioning Engineers. ASHRAE publishes standards governing HVAC and environmental control, including temperature and humidity specifications that affect AV equipment room design.

10. B — Electrical Metallic Tubing. EMT is a lightweight metallic conduit commonly used in commercial installations for low-voltage and electrical cabling. EMT fill calculations are governed by NEC Chapter 9.

11. D — Rigid Galvanized Steel or Rigid Metal Conduit. RGS and RMC refer to heavy-duty galvanized steel conduit used for mechanical protection in demanding installations. These conduits provide greater protection than EMT but are heavier and more expensive.

12. C — Fire-Retardant Intrinsic Construction cable. FIC cable meets specific fire-retardant construction requirements for installations in sensitive environments. Cable ratings appear on jacket markings per NEC requirements.

13. A — Communications Multipurpose Plenum. CMP classification under NEC designates communications cable rated for installation in air-handling plenum spaces, meeting the fire-retardant requirements for plenum environments.

14. B — Verify field conditions against project documentation. Pre-installation walkthroughs compare design documentation with actual field conditions, identifying discrepancies that require resolution before installation begins. This verification prevents installation based on outdated or incorrect design assumptions.

15. D — Building Information Modeling. BIM is a 3D digital representation of a building's physical and functional characteristics, used during design and construction for coordination across MEP, fire protection, and technology systems.

16. C — Mechanical, Electrical, and Plumbing. MEP refers to the three primary building trades coordinated during construction. AV systems frequently coordinate with MEP through BIM and coordination drawings.

17. A — Request for Information. RFIs are formal written questions to the design team requesting clarification or direction on issues discovered during installation. The RFI creates a permanent project record of both the question and the response.

18. B — Power, HVAC, lighting, acoustics, network, and mounting point conditions. A comprehensive site survey addresses all installation-relevant categories to prevent the common failure of focusing on some areas while missing others that affect the installation.

19. D — Power over Ethernet. PoE enables power delivery over standard Ethernet cabling, eliminating the need for separate power connections at IP cameras, access points, and other networked devices.

20. C — Dynamic Host Configuration Protocol. DHCP automatically assigns IP addresses to network devices, simplifying network configuration. AV installations typically use DHCP for some devices and static IP for others depending on management requirements.

21. A — Cable sources, destinations, types, and lengths for installation. The wiring schedule is the primary project document listing every cable run needed for the installation, supporting both planning and execution.

22. D — Underwriters Laboratories. UL is an independent safety certification organization whose listings and certifications appear on electrical equipment and cables, verifying compliance with safety standards.

23. B — Ethernet physical and data link layer standards. IEEE 802.3 defines Ethernet standards across all speeds and physical media, from 10 Mbps to 400 Gbps. This standard is the foundation of modern networked AV.

24. C — Wi-Fi wireless networking standards. IEEE 802.11 defines wireless LAN (Wi-Fi) standards from 802.11a/b/g through 802.11ax (Wi-Fi 6). These standards govern wireless AV networking and connectivity.

25. A — 40%. NEC fill rules permit cables to occupy up to 40% of conduit internal cross-sectional area when three or more cables share the conduit. Single cables may fill to 53%, and two cables are limited to 31%.

26. C — A Cannon Connector model designation for a specific pin count and shell design. The XLR designation originated from Cannon's Type X series with a Latch and Rubber compound, though the name has become generic for the 3-pin audio connector. The XLR is the standard professional microphone and line-level connector.

27. B — Society of Motion Picture and Television Engineers. SMPTE is the professional organization and standards body for film, television, and audio production, publishing standards that affect broadcast and media-related AV installations.

28. A — Honesty, confidentiality, competence, and respect for intellectual property. The AVIXA Code of Ethics establishes professional obligations that all credential holders agree to uphold, including ethical conduct in business dealings and client relationships.

29. D — High-Definition Multimedia Interface. HDMI is the dominant consumer and professional interface for digital video and audio transmission. HDMI versions 1.0 through 2.1 support progressively higher bandwidth for 4K, 8K, and HDR content.

30. C — High-bandwidth Digital Content Protection. HDCP is the encryption protocol protecting copyrighted video content over HDMI and DisplayPort. HDCP 2.2 is required for 4K content.

Domain B — Conducting Site Rough-In/First-Fix

31. B — Personal Protective Equipment. PPE refers to equipment worn by workers to protect against workplace hazards, including hard hats, safety glasses, gloves, and appropriate footwear. OSHA requires appropriate PPE based on the work environment.

32. A — Hard hat, safety glasses, gloves, and appropriate footwear. Professional AV installation jobsites typically require this basic PPE set to protect against common hazards including falling objects, debris, cuts, and impact injuries.

33. D — The base extends 1 foot per 4 feet of working height. The 4-to-1 rule sets the ladder angle for safe climbing stability. A 16-foot working height requires the base 4 feet from the supporting surface.

34. C — The general contractor or framing trade during construction. Structural blocking is a construction activity that must be installed during framing, before walls are closed with drywall. Coordination with the general contractor ensures blocking is in place when AV mounting begins.

35. A — 6 feet or greater. OSHA construction fall protection standards (29 CFR 1926 Subpart M) require fall protection at heights of 6 feet or greater. This is stricter than the general industry standard of 4 feet.

36. B — 5,000 pounds per worker. OSHA 29 CFR 1926.502 requires fall arrest anchor points to have minimum rated capacity of 5,000 pounds per worker, providing the safety margin needed to arrest a falling worker.

37. D — Provided sufficient passive fall protection by the guardrails. Scissor lifts equipped with full-perimeter guardrails permit operators to remain within the platform without personal fall arrest. Boom lifts, which can experience whipping motion, do require personal fall arrest.

38. C — A designated anchor on the platform. Boom lifts require personal fall arrest attached to designated platform anchors, not to ground systems or adjacent structures. The whipping motion of boom lifts can eject workers over guardrails alone.

39. B — Concrete-rated wedge anchors or sleeve anchors. Concrete masonry walls require anchors specifically designed for concrete with installation per manufacturer specifications. Wood screws and standard plastic anchors cannot effectively engage masonry.

40. A — 4 times the cable diameter. Manufacturer specifications typically require minimum 4× cable diameter bend radius during installation and 8× diameter in the final installed position. Respecting bend radius prevents internal geometry deformation.

41. D — 360 degrees. NEC Chapter 9 limits cumulative bend angle between pull points to 360 degrees, equivalent to four 90-degree bends. Exceeding this limit requires intermediate pull boxes.

42. B — The ratio of conduit internal diameter to cable outside diameter. The jam ratio describes the geometric relationship determining whether cables wedge in conduit during pulling. Specific ratio ranges (2.8 to 3.2) cause three cables to jam together.

Domain C — Installing Audiovisual Systems

43. A — 1.75 inches per rack unit. The standardized rack unit (RU) measure is 1.75 inches of vertical mounting height, the foundation of the modular rack ecosystem used in professional AV and data equipment.

44. C — 19 inches. The 19-inch width measured between front mounting flanges is the global standard for professional AV, broadcast, data, and telecommunications equipment racks.

45. D — 17.5 inches. A 10U device occupies 10 × 1.75 inches, which equals 17.5 inches of vertical mounting height. Multiplying RU count by 1.75 gives the precise vertical space requirement.

46. B — 16 amperes continuous load. The 80% rule limits continuous loads to 80% of circuit rating, so a 20-ampere circuit is limited to 20 × 0.80 = 16 amperes.

47. A — 3.412. Converting watts to BTU/hour uses the factor 3.412. Each watt of heat equals approximately 3.412 BTU/hour, essential for HVAC sizing of equipment rooms.

48. C — Ground/shield. The XLR convention assigns Pin 1 to ground/shield, Pin 2 to hot/positive, and Pin 3 to cold/negative. This AES standard ensures consistent operation across professional audio equipment.

49. B — 48 volts DC. Phantom power for condenser microphones is standardized at 48 volts DC, delivered through balanced audio cables without affecting the audio signal.

50. D — Two conductors plus shield. Balanced audio uses two signal conductors (hot and cold) carrying the signal as a voltage difference, plus a shield/ground conductor. This enables common-mode rejection.

51. B — 10. The decibel formula for power ratios uses multiplier 10 (10 × log P1/P2), while voltage ratios use 20. Understanding which formula applies prevents calculation errors.

52. D — A doubling of power. A 3 dB increase represents a power ratio of 2:1. This is one of the key decibel reference values to memorize.

53. C — 200 watts. Professional practice sizes amplifiers at 125% of total tap load, meaning a 250-watt amplifier should drive approximately 200 watts maximum tap load (250 ÷ 1.25 = 200). This headroom ensures reliable operation.

54. A — Steps down the high-voltage line to the loudspeaker's voltage. The transformer at each loudspeaker on a 70V system steps the 70-volt line down to the loudspeaker's required voltage, with a tap selector determining power.

55. D — 500 MHz. Cat6A cable supports maximum frequency of 500 MHz, twice Cat6's 250 MHz. This bandwidth supports 10GBase-T and 4K60 HDBaseT applications.

56. B — 250 MHz. Cat6 cable supports maximum frequency of 250 MHz, midway between Cat5e's 100 MHz and Cat6A's 500 MHz.

57. C — 0.5 inches. Cat6A cable specifications permit maximum 0.5 inches of untwist at termination to preserve high-frequency performance and crosstalk rejection.

58. A — Video signal transport including SDI and CATV. 75-ohm coaxial cable is the standard for video applications including SDI, composite video, CATV, and broadband video signals. 50-ohm coax is used for RF communications.

59. D — 100 meters. HDBaseT supports 4K60 video transmission over Cat6A to 100 meters (328 feet), matching general Ethernet limits.

60. B — The DDC channel embedded within the HDMI or DisplayPort cable. EDID exchange uses the Display Data Channel on dedicated pins within the cable, enabling automatic negotiation without separate connections.

61. C — 4K UHD content from compatible sources. HDCP 2.2 is required for 4K content because the original HDCP 1.x was not designed for 4K bandwidth. Every device in the signal path must support the required HDCP version.

62. A — 300 meters. OM3 multimode fiber supports 10 Gbps Ethernet to 300 meters, substantially exceeding copper Ethernet's 100-meter limit.

63. D — Green. APC (Angled Physical Contact) fiber connectors are color-coded green, distinguishing them from blue PC and beige UPC connectors to prevent accidental mating.

64. B — 0.25 to 1 millisecond. Dante audio networking operates with extremely low latency at standard settings, essential for professional audio applications.

65. C — 10 Gbps Ethernet. SDVoE distributes uncompressed 4K60 video over 10 Gbps Ethernet, providing bandwidth plus protocol overhead.

66. A — 25.5 watts. IEEE 802.3at (PoE+) provides 25.5 watts at the powered device, with 30 watts at the source; the difference accounts for cable losses.

67. D — 254 usable hosts. A /24 subnet provides 256 total addresses minus 2 reserved (network and broadcast) = 254 usable host addresses.

68. B — 10.0.0.0/8, 172.16.0.0/12, and 192.168.0.0/16. RFC 1918 defines these three private IPv4 ranges for internal networks, not routable on the public internet.

69. C — 9600 and 115200 bps. RS-232 typical baud rates are between 9600 and 115200 bps, with 9600 as the most common default.

70. A — Baud rate, data bits, parity, stop bits. RS-232 requires matching these four serial parameters between controller and device.

71. D — Unidirectional with no status feedback. IR control transmits commands only without feedback, making it limited compared to bidirectional protocols.

72. B — Verify network connectivity using ping. Ping testing is the most efficient first diagnostic step for network communication failures.

73. C — 0.40 ohms. The 5% of 8 ohms equals 0.40 ohms maximum cable resistance, preserving power transfer efficiency.

74. A — 2.67 ohms. Three 8-ohm loudspeakers in parallel equal 8 ÷ 3 = 2.67 ohms. Parallel impedance is always lower than any individual element.

75. B — Full quality until catastrophic failure at the digital cliff. Digital signals maintain full quality until bits become indistinguishable, then fail completely.

76. D — Video signal amplitude over time. A waveform monitor displays video signal voltage as a time-axis waveform, useful for signal level and sync timing verification.

77. A — Video chrominance on a polar plot. A vectorscope displays video color information as a polar plot showing hue (angle) and saturation (radius).

78. C — 10 feet. Throw ratio formula: image width = distance ÷ throw ratio = 15 ÷ 1.5 = 10 feet.

79. B — 6500K. The D65 white point at 6500K is the standard for video content calibration, producing accurate white without color tint.

80. D — 2.2. Standard video content is encoded for gamma 2.2, matching human visual perception.

81. A — 8 times image height. AVIXA DISCAS recommends 8× image height for basic decision-making content (text readable from back of room).

82. C — Flat response with omnidirectional pattern. Measurement microphones need flat frequency response and omnidirectional sensitivity to capture the room's actual acoustic conditions.

83. D — Open interoperability between manufacturers' networked audio systems. AES67 is an AES standard enabling audio exchange between different manufacturers' systems.

84. B — All loudspeakers move in the same direction on the same signal. A polarity tester verifies correct loudspeaker polarity; errors cause destructive interference and bass loss.

85. A — Insertion loss, return loss, NEXT, ANEXT, propagation delay, and other parametric measurements. Cat6A certification tests multiple parameters to verify high-frequency performance.

86. D — 4.5 Gbps. 1080p60 at 8-bit color requires approximately 4.5 Gbps of bandwidth.

87. B — 24 Gbps. 4K60 with 10-bit color and HDR requires approximately 24 Gbps, exceeding Premium High Speed HDMI's 18 Gbps capacity.

88. C — 230 watts. 10 × 15 W = 150 W plus 4 × 20 W = 80 W, totaling 230 watts. Tap load calculations determine amplifier demand.

Domain D — Perform Systems Close-Out

89. A — A-Level, B-Level, C-Level representing essential, specialized, and unique items. ANSI/AVIXA 10:2013 uses this three-level structure to categorize verification items appropriately.

90. D — A substantive deficiency affecting system function. A non-functional power switch prevents system operation, making it substantive. Substantive deficiencies receive priority for resolution.

91. B — The system is ready for its intended use and warranty typically begins. Substantial completion triggers warranty, beneficial use, and final payment provisions.

92. C — Substantial completion when the client takes beneficial use. Warranties typically begin at substantial completion because the system enters service and wear begins accumulating.

93. A — The installed system's actual configuration for future reference. As-built documentation captures the system as actually installed for future service support.

94. D — Brief focused sessions on essential operations with hands-on practice. End-user training is most effective when concise, focused on essential tasks, and includes hands-on practice.

95. B — Essential functions with screenshots and simple instructions. Quick reference guides provide brief, accessible instruction that users reference repeatedly.

96. C — Defined response times, scheduled preventive maintenance, and priority service. Service agreements combine these elements along with remote support and discounted rates.

97. A — Annual visits with more frequent visits for high-use environments. Professional maintenance recommends annual baseline with more frequent visits for demanding applications.

98. D — A formal written record of client acceptance. Signed sign-off creates the contractual record protecting both parties from later disputes.

99. B — The installer, client representative, and sometimes the general contractor. The substantial completion walk-through involves these parties for formal verification.

100. C — That the system is ready for use even though minor work may remain. The certificate documents this milestone with remaining items scheduled for final completion.

101. A — Formal signing authority for the client organization. Project completion requires signature from authorized representatives with formal signing authority.

102. C — As-built drawings, equipment manuals, warranty documentation, and verification reports. Comprehensive closeout includes all these elements to support the installation's service life.

Domain E — Conducting Ongoing Project Responsibilities

103. B — Document activities, labor, materials, and issues for the project record. Daily reports create the ongoing project record supporting schedule, change management, billing, and reference.

104. D — Obtain clarification from the design team. RFIs are formal questions documenting both question and response as project record.

105. A — A minor adaptation within installer authority but requiring documentation. Substituting equivalent accessories is minor adaptation but even minor changes should be documented.

106. C — The general contractor's superintendent and coordination meetings. The GC's superintendent coordinates across trades through structured meetings.

107. B — Work scope expands beyond original contract specifications. Change orders are required for scope expansion, documenting additions and obtaining client approval.

108. D — Cable scraps, packaging, and debris managed continuously. Clean-as-you-go integrates debris management into installation work throughout the day.

109. A — The general contractor's construction waste management system. Construction debris typically goes through the GC's waste infrastructure with appropriate disposal routes.

110. C — The project manager who can coordinate response. Trade issues route through the project manager who has authority to coordinate with the GC.

111. B — Water suppression, local exhaust ventilation, or respiratory protection. OSHA silica standard requires these specific controls; standard N95 masks are insufficient.

112. D — Conflict identification between MEP, fire protection, and technology systems. BIM coordination drawings show how building systems fit together without conflicts.

113. A — Reporting through appropriate channels for engineering review. Field-discovered design conditions must be reported for engineering review, not silently absorbed.

114. C — As soon as potential delay identified, even if impact uncertain. Early reporting permits project manager response before commitments are missed.

115. B — Be routed through the project manager for change order processing. Scope changes must flow through formal change order processes with proper approvals.

116. D — Labor and materials consumed without compensation. Unauthorized scope expansion is typically not recoverable because it was not contracted.

117. A — Both as-built records and traceability of decisions under installer authority. Field engineering documentation supports both purposes.

118. C — Either perform firestopping correctly or coordinate with the firestop contractor. Firestopping is life-safety work requiring proper materials and methods.

119. B — Stopping work immediately and contacting qualified asbestos abatement personnel. Asbestos requires specialized handling by qualified abatement contractors.

120. D — Understands why the failure occurred so it does not recur. Root-cause analysis addresses fundamental causes, preventing recurrence rather than managing symptoms.

121. A — 7 to 10 years. Professional AV installations typically have 7-10 year service life before substantial refresh.

122. C — Increasing service frequency, declining reliability, parts unavailability. These indicators signal approaching service life end, supporting proactive refresh planning.

123. B — Factory-reset or data-wiped before leaving the client's site. Decommissioned equipment with configuration data must be reset to protect sensitive information.

124. D — Restricted materials in electronic equipment requiring responsible handling. RoHS restricts hazardous materials and requires responsible end-of-life processing.

125. A — Through the entire service life via maintenance and service. The installer-installation relationship extends through the system's full service life with recurring maintenance and service.