

Residential Systems Installation & Maintenance

Written Exam – 100 Questions Across 7 Categories – 60 Minutes Allowed

ANSWERS

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No Dissemination

Electronic Systems Technical Skills

- The device normally used at the point where the telephone or cable company's responsibility ends & the homeowner's responsibility begins is called _____.
 - Demarc
 - NIC
 - DDI
 - NIB
- _____ is the technology infrastructure transmission standard in use today.
 - POTS
 - TCP/IP
 - IP
 - Windows RCP
- When wiring a steel-framed building, use the cutouts in the metal framing material & use a _____ to protect the cable.
 - grommet
 - piece of PVC conduit
 - nail guard
 - warning tag
- Ohm's law states the voltage in a circuit is equal to the current times the resistance.
 - True
 - False
- To help protect against Electromagnetic Interference, EMI, use a cable with _____.
 - shielding
 - a large gauge
 - solid conductors
 - stranded conductors

6. Keypads should be mounted _____ inches AFF, Above Finished Floor.
- 24 to 36
 - 12 to 24
 - 48 to 52
 - 72 to 84
7. When installing Cat-5e cable, the minimum bend radius to maintain is _____.
- 1/2 inch
 - 1 inch
 - 1½ inches
 - 2 inches
8. To avoid EMI, place low voltage cables parallel to, & a minimum of _____ inches from electrical power cables, & preferably _____ inches.
- 2, 12
 - 6, 12
 - 12, 24
 - 24, 36
9. When terminating Category 5e cable on a 66 block or 110 block, use _____ termination.
- IDC, Insulation Displacement Contact
 - IDC, Installation Direct Contact
 - RJ-45
 - RJ-31
10. Every EST should consider industry certification to _____.
- offer verification of their skills
 - differentiate their firm from the competition
 - provide a value-added service to their firm
 - all of the above
11. _____ occurs when two or more components have different ground connections & current flows on the shields between the equipment.
- ground leak
 - ground loop
 - crosstalk
 - EMI
12. Damage to cables, or cables & connections exposed to water, may cause _____, resulting in noise entering the signal path, causing hiss, crosstalk, hum in audio, & flickering & reduced output in video.
- EMI
 - ground leak
 - crosstalk
 - RFI

13. When terminating UTP cable pairs, the maximum each pair can be untwisted is _____.
- a. None
 - b. ½ inch
 - c. 1 inch
 - d. does not matter
14. Cables are marked with a designation suffix showing where the cable may be used. A cable marked with “P” is designed to be used in _____.
- a. general purpose settings
 - b. risers or between floors
 - c. commercial properties
 - d. plenum spaces, above ceilings & below floors
15. The minimum bend radius for RG-6 coaxial cable is _____.
- a. 1 inch
 - b. 2 inches
 - c. 3 inches
 - d. 4 inches
16. Signal performance over wire can be impacted by _____. (Select all that apply)
- a. Crosstalk
 - b. Attenuation
 - c. Resistance
 - d. termination
17. To reduce interference within a Cat 5 twisted pair cable the pairs are all twisted in the same direction.
- a. True
 - b. False

IP Networking

18. Electronic Static Discharge, ESD, is the _____.
- a. loss of a signal as it moves away from its source
 - b. interference of a signal with other electronic devices, such as fluorescent lights
 - c. deterioration of network signal due to static electricity in low humidity environments
 - d. transfer of static electricity from you to components, potentially causing serious damage to equipment
19. The role of a switch on a home network is to _____.
- a. isolate the home network from the Internet
 - b. allow the home network to connect to other home networks
 - c. allow the home network to be viewed from the Internet
 - d. provide the physical connection between the router & other network devices
20. The class of IP addresses called _____ has only 254 hosts per network & is used for most home networks.
- a. Class A
 - b. Class B
 - c. Class C
 - d. Class D

21. A typical router has ____ IP address(es) & _____.
- One, is used to connect to the LAN
 - One, is used to connect to the Internet
 - Two, one is for the Web & one is for the Internet
 - Two, one shows privately on the LAN & the other shows publicly on the Internet
22. To configure the router to only accept LAN traffic from the firewall, set up the router to _____.
- only accept traffic from the NetBIOS name of the firewall
 - only accept traffic from the MAC address of the firewall
 - physically connect to the firewall with a crossover cable
 - none of the above
23. When creating a DHCP server in the router for a client's home network, use a private IP Address range. _____ is considered a private IP address range.
- 132.5.1.1-10
 - 120.2.1.1-10
 - 192.168.0.1-10
 - 11.11.11.11-21
24. _____ is a valid IP address.
- google.com
 - 198.2.64.12.3
 - 192.259.0.1
 - 192.168.0.2
 - All of the above
25. A domain name server assigns a name to a MAC address.
- True
 - False
26. The benefit(s) of NAT include _____.
- Enabling the use of more internal IP addresses
 - Providing security by hiding internal IP addresses
 - Allowing the entire home network to use only one external IP address
 - A & B
 - All of the above
27. The operating frequency of the IEEE 802.11b Wi-Fi version is _____.
- 100 MHz
 - 600 MHz
 - 900 MHz
 - 1000 MHz
 - 2.4 GHz
28. When wiring a network in a residence, follow the _____ wiring standard.
- POTS
 - T568A
 - T568B
 - T568P

29. A computer in each bedroom, a printer in the home office, IP security cameras, & a media server in the living room can best be described as a:

- a. WAN
- b. LAN**
- c. MAN
- d. None of the above

30. Use a _____ connector on a Cat 5e Ethernet network cable.

- a. RJ-11
- b. RJ-45**
- c. XLR
- d. BNC

31. The color pairs in Cat 5e cable are _____, _____, _____ & _____.

- a. blue, red, yellow, green
- b. brown, green, orange, red
- c. green, orange, yellow, blue
- d. orange, brown, green, blue**

32. A MAC address is the physical or hardware address of a network device & is assigned by the _____.

- a. manufacturer**
- b. modem
- c. network device
- d. router

33. Port numbers are used to send & receive data. Web browsing uses port _____ & sending email uses port _____.

- a. 20, 80
- b. 25, 80
- c. 80, 20
- d. 80, 25**

34. Use a _____ to protect against intruders external to the network.

- a. Firewall**
- b. Proxy Server
- c. Switch
- d. MAC

35. Wireless signals from a WAP can be stopped from traveling outside the home by _____.

- a. distance configuration in WAP setup
- b. installing WAP reflectors around the outside of the home
- c. A & B
- d. None of the above**

36. When connecting to a wireless network, the SSID is required. This is obtained by _____.

- a. entering the WEP key in the WAP
- b. entering the pass phrase in the WAP
- c. listening to the WAP broadcast**
- d. request settings from the router

37. DNS (Domain Name Service) automatically assigns unique IP addresses to network devices when they are turned on & connected to a network.

- a. True
- b. False

38. The maximum length of a complete network segment built with 10BaseT Cat-5e cable should not exceed _____.

- a. 10 meters
- b. 85 meters
- c. 100 meters
- d. 100 feet

39. The assignment of IP addresses to devices is typically handled by the _____ process.

- a. DNS
- b. DHCP
- c. NAT
- d. MAC

40. When discussing networking technologies, the "10" in the term "10BaseT" stands for the _____.

- a. number of conductors used in the cable
- b. data rate in megabytes per second
- c. data rate in megabits per second
- d. diameter of the cable

41. The amount of time it takes a VoIP packet to reach its destination is known as _____.

- a. latency
- b. jitter specification
- c. codec
- d. QOS, Quality of Service

42. A three jack video system is commonly called _____ ?

- a. VGA video
- b. S-Video
- c. Composite Video
- d. Component Video

Audio / Video

43. A surround sound system with channels: Left, Center, Right, Subwoofer, Left-rear, & Right-rear, is called _____.

- a. Dolby Digital
- b. 5.1
- c. 6.0
- d. 6.1

44. The coaxial cables used for antennas & distributing video signals typically have _____ impedance.

- a. 53 ohms
- b. 300 ohms
- c. 90 ohms
- d. 75 ohms

45. When turning on the audio system the amplifier shuts down, this problem could be caused by _____.
- a. an open wire to the speaker
 - b. a shorted speaker**
 - c. the system is muted
 - d. a disconnected input
46. If one speaker is out of phase with the other, it will _____.
- a. have no effect on the system or sound
 - b. damage the speaker(s)
 - c. damage the amplifier
 - d. work but will have no depth of field**
47. If there are horizontal bars moving up or down through a monitor connected by composite video, most likely the video cable is _____.
- a. shorted
 - b. too close to electrical wiring**
 - c. too long
 - d. kink in it
48. Subwoofers are used to reproduce low frequency sound which is _____.
- a. deep
 - b. non-directional**
 - c. directional
 - d. sonic
49. In a multi-room audio system a 'zone' is an area or group of rooms that _____.
- a. functions as an independent source of music
 - b. receives audio from the system**
 - c. distributes video to the system
 - d. All of the above
50. Sound is measured in _____.
- a. mL
 - b. Ω
 - c. dB**
 - d. W
51. Amplifier power is expressed in watts, & the sound generated by speakers is measured in decibels (dB).
- a. True**
 - b. False
52. As the length of a wire run increases, _____ also increases.
- a. Resistance**
 - b. Wattage
 - c. Interference
 - d. frequency response

53. In a whole house audio system with four rooms of stereo speakers driven with only a single amplifier at the head-end _____ volume controls must be used.

- a. impedance matching
- b. standard
- c. non-impedance matching
- d. switching

54. If you measure the sound from a speaker to be 87dB at 50 Watts, to get 90dB from the speaker you will need _____ watts.

- a. 25
- b. 50
- c. 100
- d. 200

55. As resistance increases, impedance increases.

- a. True
- b. False

56. The standard screen aspect ratio for HDTV is _____.

- a. 4:3
- b. 1:1
- c. 16:9
- d. None of the above

57. Video displays using _____ scanning to 'paint' images on the screen can produce a better image than _____ scanning at the same resolution.

- a. SDTV, EDTV
- b. progressive, interlaced
- c. EDTV, HDTV
- d. interlace, progressive

58. Plasma displays typically offer a wider viewing angle than LCD displays.

- a. True
- b. False

59. A video output format that usually uses 3 RCA connectors is called _____ & is a(an) _____ signal.

- a. component, analog
- b. composite, analog
- c. s-video, analog
- d. component, digital

60. Digital video signals can be sent over _____ video outputs.

- a. composite
- b. component
- c. HDMI
- d. RGBHV

61. A 15 pin D-Sub connector is typically used to output _____ signals from computers to video displays.
- a. VGA
 - b. HDMI
 - c. DVI
 - d. A & B
62. The most basic video signal is _____.
- a. component video
 - b. S-VHS
 - c. DVI video
 - d. composite video

Home Theater

63. Which remote control technology does not require the remote to be pointed at the device it is operating?
- a. Infrared
 - b. TCP/IP
 - c. RF
 - d. Both B & C above
64. The purpose of an Real Time Analyzer, RTA, is to:
- a. Measure color temperature
 - b. Determine the distortion on an audio frequency
 - c. Determine loudness at specific frequencies
 - d. None of the above
65. IR Leakage occurs when:
- a. IR wires are not insulated properly
 - b. Too much power is applied to the IR blaster
 - c. More than one component sees the IR blaster
 - d. An IR blaster is cracked
66. An SPL Meter would most likely be used during the _____ stage.
- a. pre-wire
 - b. calibration
 - c. installation
 - d. trim-out
67. Video signals are many. The one to use for the best image is _____.
- a. Component video
 - b. HDMI video
 - c. Composite video
 - d. S-Video

68. If the room has high ambient light you would NOT want to use _____.
- a. rear projection
 - b. front projection**
 - c. PDP direct view
 - d. LCD direct view
69. The “p” in 1080p stands for progressive scanning.
- a. True**
 - b. False
70. A UPS protects home theater components from _____.
- a. lightning strikes
 - b. programming changes by the user
 - c. memory loss during a power outage**
 - d. voltage spikes
71. The amount of wattage required for an amplifier in a home theater is a function of the _____.
- a. efficiency of the speakers
 - b. distance from the speaker to the listener
 - c. desired volume level at the listener
 - d. all of the above**
72. To deal with the heat generated by home theater equipment _____.
- a. use portable fans to circulate the room air
 - b. turn off the equipment when not in use
 - c. keep the room temperature low
 - d. build in ventilation for the equipment**
73. Video calibration typically covers
- a. contrast (white level) & brightness (black level)
 - b. sharpness
 - c. color hue, saturation & temperature
 - d. all of the above**
74. When aligning a projector, the _____ option will help make the image perfectly square.
- a. lens shift
 - b. zoom
 - c. keystone**
 - d. focus
75. To increase the volume by 3db you must _____ the wattage.
- a. double**
 - b. triple
 - c. half
 - d. none of the above

Security & Surveillance

76. A contact that has no continuity when not activated is said to be _____.
- a. normally closed (NC)
 - b. normally open (NO)**
 - c. Defective
 - d. An EOL device
77. Series wired contact sensors use _____ contacts.
- a. multiple
 - b. normally closed**
 - c. normally open
 - d. tripped
78. A security system uses a _____ jack to seize the phone line in an alarm situation.
- a. RJ-31X**
 - b. RG-31
 - c. RJ-45
 - d. RG-59
79. To maximize contrast, it is recommended to use a(an) _____ camera.
- a. Color
 - b. Black & white**
 - c. Infrared
 - d. UV
80. A camera that can only track horizontal movement is known as a _____ camera.
- a. IP
 - b. PTZ
 - c. Pan**
 - d. stationary
81. The minimum light level a camera can capture a clear image is expressed in the _____ rating in the camera specifications.
- a. watts
 - b. lumens
 - c. PTZ
 - d. lux**
82. In areas where light is not sufficient for surveillance cameras, _____ are used.
- a. IR illuminators**
 - b. color cameras
 - c. spot lights
 - d. PTZ cameras

Integrated Control

83. A home control system uses Ethernet to communicate between the controller & 10 remote devices. To communicate to all remote devices, the controller must have _____ Ethernet ports.

- a. 1
- b. 2
- c. 3
- d. 5
- e. 10

84. The process of having a series of commands operate from a single button press is known as

- a. Auto program
- b. Scene
- c. Macro
- d. Step-by-step

85. The total wattage of all the devices connected to a lighting control device is typically known as the _____.

- a. total load
- b. lighting budget
- c. circuit size
- d. control current

86. A single HVAC system that uses two thermostats & maintains independent temperatures in two areas is called a _____ system.

- a. split
- b. two-zone
- c. dual-thermo
- d. duplex

87. HomePlug devices communicate using _____.

- a. power lines
- b. phone lines
- c. RF
- d. phono plugs

88. A homeowner is considering using Bluetooth-enabled devices for various functions. _____ is the maximum recommended distance for a Bluetooth device to communicate reliably.

- a. 12 feet
- b. 30 feet
- c. 75 feet
- d. 150 feet

89. In a home control system, use the _____ feature to turn lights on & off based on a specific time of day.

- a. solar motion sensor
- b. astronomical timer
- c. photo sensor
- d. clock timer

90. _____ is the best type of user interface for a home control system.
- a. Keypad
 - b. Computer
 - c. Remote control
 - d. Let the homeowner decide
91. A lighting control system can control _____.
- a. individual lamps
 - b. lighting scenes
 - c. window treatments
 - d. All of the above
92. An HVAC thermostat needs _____ volts traveling on the _____ color wire to operate.
- a. 24 , yellow
 - b. 24 , red
 - c. 48 , yellow
 - d. 48 , red
93. Power surges can come from _____. Select all that apply
- a. power fluctuations from the power company
 - b. high power use devices in the home
 - c. wireless transmitters
 - d. master controller
94. When power is lost, a(n) _____ is used to keep constant power for critical equipment.
- a. HVAC
 - b. UPS
 - c. KSU
 - d. PTZ

Troubleshooting Methodology & Documentation

95. An Uninterruptible Power Supply _____.
- a. switches from AC to battery power when it detects an AC power line fault
 - b. provides AC power through an inverter, powered by batteries, that are charged from the AC line
 - c. switches to an alternate AC power circuit when it detects a disturbance on the current AC power circuit
 - d. Starts an AC power generator when it detects an AC power line fault
96. OSHA is an acronym for _____.
- a. Organization for Safe Home Appliances
 - b. Occupational Safety & Health Administration
 - c. Organization of Shared Home Appliances
 - d. Organization for Safety in Home Applications

97. NEC is an acronym for _____.

- a. National Electrical Code
- b. Nominal Electrical Current
- c. National Electronics Certification
- d. Network Enhanced Channel
- e. Normally Exposed Conductor

98. MSDS is an acronym for _____.

- a. Material Safety Data Sheet
- b. Manufacturers Summary of Data Speeds
- c. Manufacturers Supply Depot Summary
- d. Massively Serial Data Stream

99. A surge from a lightning strike can enter a home through _____.

- a. cable service feed
- b. electrical service feed
- c. outdoor speakers
- d. All of the above

100. If two computers both have the same IP address, they will _____.

- a. be able to communicate with each other
- b. not be able to communicate with each other
- c. communicate with each other but not the Internet
- d. None of the above