

Taking the Certification Test

Each question has **only one correct answer**. Please record all answers on this answer sheet. The order of the questions in the test roughly follows the order of topics covered in class. All questions are equally weighted. A passing score is 90%.

Returning the Certification Test

Option 1: Fax the answer sheet (following page) to **Yaskawa Technical Training Services** at (847) 887-7185.

Option 2: E-mail the answers to all questions to **training@yaskawa.com**. Be sure to include all of the contact information listed on the answer sheet.

Option 3: Mail the answer sheet to **Yaskawa Technical Training Services** at the address shown on the bottom of this page.

Receiving Your Score

When the test is taken during the training class, you will receive your score in class as soon as it can be graded. When taken as a CLEP test, receive your score from Technical Training Services by sending an email to **training@yaskawa.com** or call 800-927-5292, dial 4 for product training. In either case, you may review your answers only if a passing score is received.

Answer Sheet:

- | | | | | |
|----------|-----------|-----------|-----------|-----------|
| 1. _____ | 6. _____ | 11. _____ | 16. _____ | 21. _____ |
| 2. _____ | 7. _____ | 12. _____ | 17. _____ | 22. _____ |
| 3. _____ | 8. _____ | 13. _____ | 18. _____ | 23. _____ |
| 4. _____ | 9. _____ | 14. _____ | 19. _____ | |
| 5. _____ | 10. _____ | 15. _____ | 20. _____ | |

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Contact Information:

Name: _____ Title: _____

Company: _____ Email: _____

Address: _____

Phone Number: _____ Fax number: _____

Supervisor's Name/ Title: _____

Test Date: _____

Physical Bus Overview

1. What is the name for devices on an industrial bus?
 - a. AC Drive
 - b. Node
 - c. Component
 - d. Slave
2. Terminating resistors are used to tune the data lines for proper data transmission.
 - a. True
 - b. False
3. Repeaters selectively transfer data to the connected network segments
 - a. True
 - b. False
4. Using a switch is less efficient than using a hub.
 - a. True
 - b. False
5. Which of the following is NOT true about two-wire RS-485?
 - a. Data lines A and B are complementary of one another.
 - b. Terminating is not required on an RS-485 network.
 - c. The transmitter and receivers are connected on individual nodes.
 - d. RS-485 utilizes balanced communication.
6. What voltage is used on a DeviceNet bus?
 - a. 5 VDC
 - b. 12 VDC
 - c. 24 VDC
 - d. 120 VAC
7. When should an Ethernet crossover cable be used?
 - a. Connecting from a node into a switch.
 - b. Connecting from a master node into a hub.
 - c. Connecting from a master directly to a node.
 - d. Connecting from a laptop to a node through a switch.
8. Yaskawa recommends using shielded twisted pair Cat-5 cable for industrial Ethernet applications.
 - a. True
 - b. False
9. Twisted pair increases cross talk in the data lines, allowing better communication.
 - a. True
 - b. False
10. Which type of cabling is used for drop-lines on a DeviceNet bus?
 - a. Thick
 - b. Thin
11. Which topology is most recommended for RS-485 based networks?
 - a. Ring
 - b. Bus
 - c. Star
 - d. U.S. Geological Survey

Bus Communication – Signals and Protocols

12. As transmission speed increases, transmission distance increases.
- a. True
 - b. False
13. What is the maximum length for an RS-485 based network?
- a. 400ft
 - b. 500m
 - c. 4000m
 - d. 4000ft
14. What value is the terminating resistance equivalent to?
- a. Number of votes received by Governor Schwarzenegger's opponents.
 - b. Parallel combination of input resistance for all bus nodes.
 - c. Sum of all stator resistances.
 - d. Characteristic cable impedance.
15. Why is active termination used?
- a. Prevent data lines from floating when the bus is idle.
 - b. Minimize bus throughput.
 - c. Increase transmission errors.
 - d. Less expensive than passive termination.
16. The protocol defines the format and control for interaction on the bus.
- a. True
 - b. False
17. The master responds to the nodes' request for information during master-controlled operation.
- a. True
 - b. False
18. Which type of CSMA does Ethernet use?
- a. Bitwise Arbitration
 - b. Collision Avoidance
 - c. Collision Detection
 - d. Wireless CDMA
19. In the Token-Ring media access method, the node with the token:
- a. Acts temporarily as the bus master.
 - b. Is allowed to communicate with the master.
 - c. Can ignore commands from the master.
 - d. Gets to play the last video game in the arcade.

Common Problems

20. What is the best way to help problems from occurring on a network?
- a. Never use an industrial network on your application.
 - b. Always follow network specifications.
 - c. Run both power and communication wiring in the same conduit.
 - d. Use the least expensive cable available on the market.
21. Which of the following is NOT true regarding grounding procedures?
- a. Always follow network specifications.
 - b. Use single-point grounding procedures.
 - c. Use ground loops to insure an adequate earth ground.
22. Shields should be connected at both ends of the cable.
- a. True
 - b. False
23. Termination techniques should follow network specifications and will prevent wave reflections from occurring.
- a. True
 - b. False

YEA Network Options Spreadsheet (Short answer)

24. What is the part number for the F7 DeviceNet card?
25. Which Drives have Ethernet cards available?
26. Which Drives have Commercial protocols built-in?
27. What website can be used for obtaining more information about Profibus?
28. What speeds and segment lengths are available for DeviceNet?