Certification Test

CT.DirectDrive 01.eLM.CertificationTest

Student Name: _____

Company Name: _____

Address: _____

Phone: _____

Email: _____

Test Date: _____

Answers:

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Taking the Test

- The purpose of this test is to validate the learning experience corresponding to the applicable eLearning Module. It is recommended to preview the questions before viewing the module, and answer them as the module progresses.

- The test is open book. You may use any website, manuals, software, demo, etc. The test must be taken individually; you may not contact another person for help.

- Each question has only one correct answer unless otherwise noted. Please clearly record all answers on the answer sheet. All questions are equally weighted. A passing score is 90%.
- This test applies to the following eLearning modules.

    1. Direct Drive Servos **(eLV.DirectDrive.01.TechIntro)**
    2. Yaskawa Direct Drive Motors **(eLV.DirectDrive.02.ProductLine)**

Returning the Test

- Please return **only the first page** of the test (the answer sheet) with completed answers and contact information.

Option 1: Fax the answer sheet to **Yaskawa Technical Training Services** at **(847) 887-7185.**
Option 2: e-mail a scan, photo, or edited pdf of the answer sheet with all answers and contact information to **training@yaskawa.com**.

Receiving Your Score

You may review your answers only if a passing score is received. You will receive a system-generated email with your score. Please allow up to 5 business days.

Direct Drive Servos (eLV.DirectDrive.01.TechIntro)

1. What are the performance characteristics of a direct drive motor?
   A. High torque and high speed
   B. Low torque and high speed
   C. High torque and low speed
   D. Low torque and low speed

2. Which types of applications are suitable for a direct drive motor?
   A. High speed linear applications
   B. High speed rotary applications
   C. Low speed linear applications
   D. Low speed rotary applications

3. Which direct drive motor technology is capable of the highest acceleration?
   A. Iron core inner rotor
   B. Coreless inner rotor
   C. Outer Rotor

4. Which cost factors apply to a machine driven by a direct drive motor?
   A. Components such as couplings and bearings
   B. Design and engineering of more complex machine
   C. Performance limitations due to backlash and rigidity
   D. All of the above
   E. A and C only
   F. None of the above

5. Which order (best to worst) best ranks the position settling time of a rotary drive mechanism?
   A. Direct drive motor, servo driven gear, servo driven belt
   B. Servo driven gear, direct drive motor, servo driven belt
   C. Servo driven belt, servo driven gear, direct drive motor

6. Which rotary drive solutions have zero backlash?
   A. Direct drive motor
   B. Servo driven gear
   C. Servo driven belt
   D. All of the above
   E. B and C only
   F. None of the above

7. Which rotary drive solutions are likely to require an additional bearing to support the load?
   A. Direct drive motor
   B. Servo driven gear
   C. Servo driven belt
   D. All of the above
   E. B and C only
   F. None of the above

8. Which mechanisms generally experience performance decrease over time due to wear of the power transmission components?
   A. Direct drive motor
   B. Servo driven gear
   C. Servo driven belt
   D. All of the above
   E. B and C
   F. None of the above

9. Yaskawa's published case study compared a direct drive motor to a servo-driven gear motor of similar capacity running the same load and motion profile. What were the times required to settle to within 0.05 degrees after the end of the move?
   A. Direct Drive: 25ms | GearMotor:130ms
   B. Direct Drive: 50ms | GearMotor:200ms
   C. Direct Drive: 225ms | GearMotor:305ms

10. In low speed rotary applications, the rigidity of which elements affect resonant frequencies?
    A. Motor mounting frame
    B. Transmission between motor and load
    C. Load adapter plates between motor and load
    D. The load itself
    E. All of the above
    F. C and D only
    G. None of the above

Yaskawa Direct Drive Motors (eLV.DirectDrive.02.ProductLine)

11. What is the **construction** of the **SGM7F** motor series?
    A. Iron Core, Inner Rotor
    B. Iron Core, Outer Rotor
    C. Coreless, Inner Rotor
    D. Coreless, Outer Rotor

12. What are the **characteristics** of the **SGM7F** motor series?
    A. Fastest speed of all Yaskawa direct drive motors
    B. Highest torque of all Yaskawa direct drive motors
    C. Highest load of all Yaskawa direct drive motors

13. What are the **application** strengths of **SGM7F** motor series
    A. Robotic mechanisms
    B. Rotary positioning
    C. Small rotary tables
    D. Large rotary tables
    E. All of the above
    F. A B and C only

14. What is the **construction** of the **SGM7D** motor series?
    A. Iron Core, Inner Rotor
    B. Iron Core, Outer Rotor
    C. Coreless, Inner Rotor
    D. Coreless, Outer Rotor

15. What are the **characteristics** of the **SGM7D** motor series?
    A. Each frame size /diameter is unique
    B. Largest load capacity
    C. Lowest speed
    D. All of the above

16. What are the **application** strengths of the **SGM7D** motor series?
    A. Robotic mechanisms
    B. Rotary positioning
    C. Small rotary tables
    D. Large rotary tables
    E. All of the above
    F. C and D only

17. What is the **construction** of the SGM7E motor series?
    A. Iron Core, Inner Rotor
    B. Iron Core, Outer Rotor
    C. Coreless, Inner Rotor
    D. Coreless, Outer Rotor

18. What are the **characteristics** of the SGM7E motor series?
    A. Matches torque and speed of the SGM7F series
    B. Zero cogging torque
    C. All of the above

19. What are the **application** strengths of the **SGM7E** motor series?
    A. Precise speed control
    B. Smallest size
    C. All of the above