

CEU Certification Test

Drive Road Show: TRM040-DrivesRoadShow-CEU

YASKAWA

Taking the Certification Test

Please record all answers on this answer sheet. The total number of points possible on this test is 35. A passing score is 80% or better (no more than 7 wrong).

Returning the Certification Test to Yaskawa

Scan this entire test and email to training@yaskawa.com.

Receiving Your Score and CEUs

CEU credits will be awarded to those students who have attended the Road Show class in its entirety and passed the certification test with a score of 80% or better. Yaskawa does not provide partial CEU credits for less than 100% attendance. Technical Training Services will send you an email to inform you of your score and if you have been awarded CEU credits (please be sure to provide your email address below).

CEU credits awarded for the Road Show class: 0.3

Answers:

- | | | | | | |
|----------|-----------|-----------|-----------|-----------|-----------|
| 1. _____ | 7. _____ | 13. _____ | 19. _____ | 25. _____ | 31. _____ |
| 2. _____ | 8. _____ | 14. _____ | 20. _____ | 26. _____ | 32. _____ |
| 3. _____ | 9. _____ | 15. _____ | 21. _____ | 27. _____ | 33. _____ |
| 4. _____ | 10. _____ | 16. _____ | 22. _____ | 28. _____ | 34. _____ |
| 5. _____ | 11. _____ | 17. _____ | 23. _____ | 29. _____ | 35. _____ |
| 6. _____ | 12. _____ | 18. _____ | 24. _____ | 30. _____ | |

Contact Information:

Name: _____ Title: _____

Company: _____ Email: _____

Address: _____

Phone Number: _____ Cell number: _____

Supervisor's Name/ Title: _____

Name of Yaskawa Rep: _____

Test Date: _____ Road Show Date: _____

Road Show

Location: _____

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- 1.) T or F By including slip to the formula for the synchronous speed of an induction motor, we get the rated speed. *(1 point)*

- 2.) Which motor enclosure type has the widest speed range? *(1 point)*
 - a.) open drip proof
 - b.) totally enclosed non-ventilated
 - c.) totally enclosed fan cooled
 - d.) totally enclosed blower cooled

- 3.) T or F Swapping the input leads of a drive will cause the motor to reverse direction. *(1 point)*

- 4.) Name the “brain of the VFD”. *(1 point)*
 - a.) gate driver board
 - b.) I/O board
 - c.) control board
 - d.) medulla oblongata

- 5.) What are the three major sections of a VFD? *(1 point)*
 - a.) diodes, capacitors, motor
 - b.) line voltage, resistors, capacitors
 - c.) converter, DC bus, inverter
 - d.) none of the above

6.) What is the least you need to know before programming a drive, as described in this class?
(1 point)

- a.) motor FLA
- b.) maximum motor voltage
- c.) maximum motor frequency
- d.) the run command source
- e.) the frequency reference source
- f.) the width of the drive
- g.) all of the above
- h.) a thru e
- i.) none of the above

7.) Where would you find the serial number of the drive? (1 point)

- a.) the name plate on the side
- b.) on the front cover
- c.) on the label of the drive's carton box
- d.) the motor name plate
- e.) a through c
- f.) none of the above

8.) T or F The number of output transistor pulses per second is the definition for carrier frequency (fc)? (1 point)

9.) If the voltage supplied to an induction motor decreases by 15% (with no change to the frequency) what happens to the full load amps? (1 point)

- a.) increase
- b.) decrease
- c.) stay the same
- d.) none of the above

10.) If the voltage supplied to an induction motor increases by 15% (with no change to the frequency) what happens to the full load amps? (1 point)

- a.) increase
- b.) decrease
- c.) stay the same
- d.) none of the above

11.) What is the formula to calculate horsepower? (1 point)

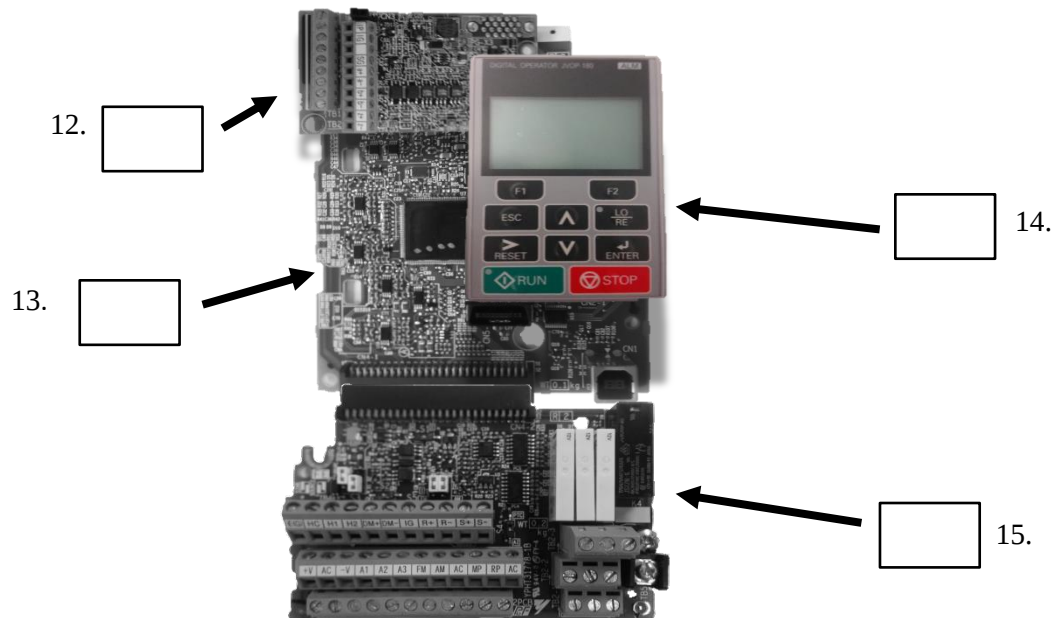
- a.) $v = I * r$
- b.) $c^2 = a^2 + b^2$
- c.) $HP = (120 \times f) / p$
- d.) $HP = (\text{torque} \times \text{RPM}) / 5250$
- e.) none of the above

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Identify the parts of a drive by putting the correct letter in the corresponding box for each item.
(1 point each)



- a. Keypad / HOA /Operator
- b. Control board
- c. I/O Terminal board
- d. Option board

16.) T or F Running a motor above its base speed, will cause the motor's torque to decrease.
(1 point)

17.) Which value is normally shown on the motor nameplate? (1 point)

- a.) Synchronous speed
- b.) Rated speed

18.) What does the V/f pattern for a PWM drive represent? (1 point)

- a.) the speed and torque
- b.) the volts and Hz
- c.) the current and load
- d.) temperature and frequency
- e.) none of the above

19.) What does the acronym PWM stand for? (1 point)

- a.) Pulse Width Management
- b.) Pro Wrestling Mag
- c.) Private Wealth Management
- d.) Pulse Width Modulation
- e.) none of the above

20.) T or F Like magnetic poles attract. (1 point)

21.) What is the formula for the synchronous speed of an induction motor? (1 point)

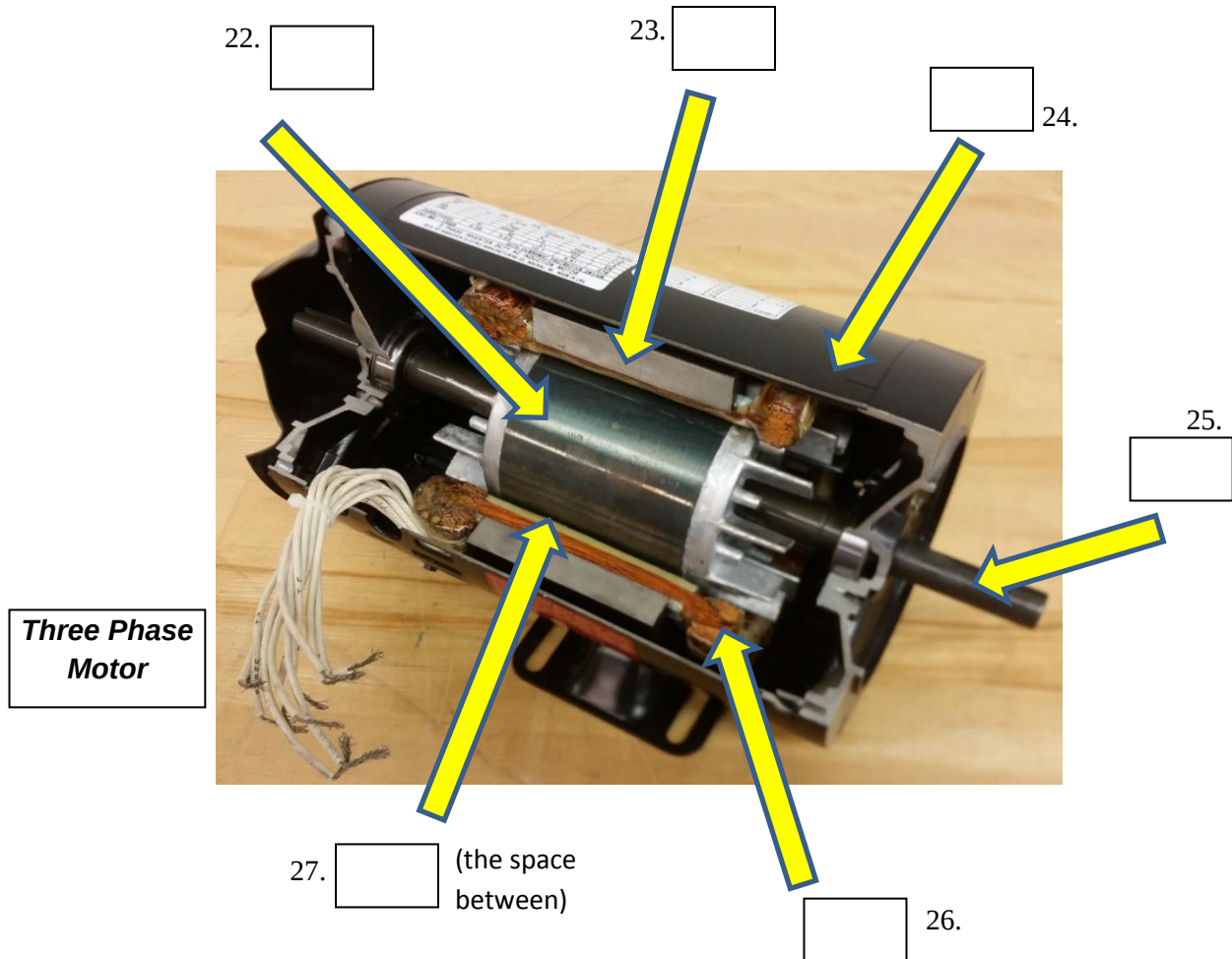
- a.) $s = (N_a - N) / N_a$
- b.) $N = (360 \times f) / p$
- c.) $N = (120 \times f) / p$
- d.) $c^2 = a^2 + b^2$
- e.) none of the above

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Identify the parts of the motor by putting the correct letter in the corresponding box for each item.
(1 point each)



- a. Rotor
- b. Stator
- c. Air gap
- d. Shaft
- e. Stator winding
- f. Enclosure

28.) What is the synchronous speed of an eight pole motor? (1 point)

- a.) 1200 RPM
- b.) 1800 RPM
- c.) 1900 RPM
- d.) 3600 RPM
- e.) none of the above

29.) What causes an EF3 fault on the display of the drive? (1 point)

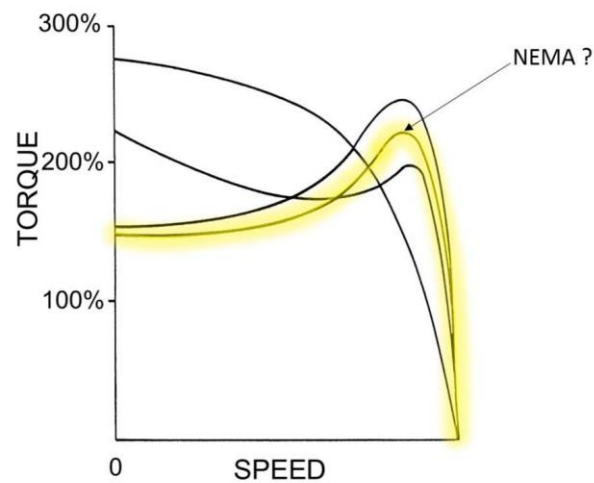
- a.) activated input terminal 3 programmed for external fault
- b.) swirling winds in the Great Plains states
- c.) a 3-phase external filter
- d.) low input voltage to the drive

30.) What can cause an overvoltage (OV)? (1point)

- a.) the line voltage
- b.) regenerated power from the motor
- c.) a shorted motor winding
- d.) all of the above
- e.) none of the above

31.) When "bb" is displayed on the keypad, what does it stand for? (1 point)

- a.) baseball
- b.) the number 66
- c.) baseblock
- d.) none of the above

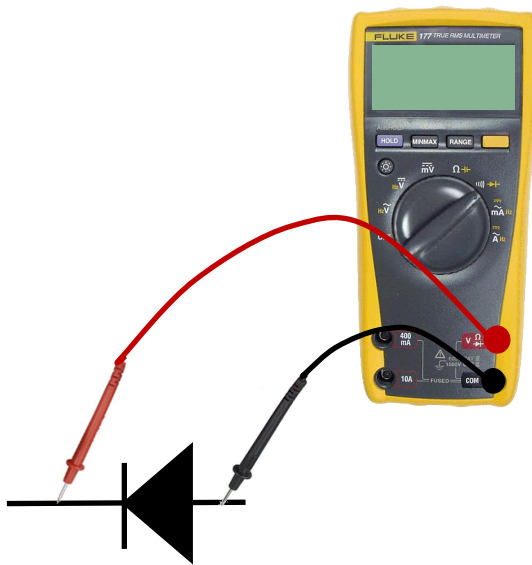


32.) What NEMA motor design is highlighted in the image above? (1 point)

- a.) NEMA Design A
- b.) NEMA Design B
- c.) NEMA Design C
- d.) NEMA Design D

33.) Checking this diode (in the image below) using a digital multi-meter in the diode check mode, what reading would be on the display? (1 point)

- a.) 0.5
- b.) 1.0
- c.) oL
- d.) 355



34.) What is the flashing LED, on the RUN button, an indication of? (1 point)

- a. the RUN is given but the frequency reference is 0Hz.
- b. the STOP button was pressed during remote operation, interrupting the drive.
- c. both a and b.
- d. neither a or b.

35.) T or F All parameters can be changed while the drive is in RUN mode? (1 point)