

Name

Class

Date

: _____ : _____ e: _____

Chapter 01 - Safety

1. The safe zone around a robot is _____.

- a. the same as the work envelope
- b. the area just outside of the reach of the robot
- c. often where the operator works
- d. the area where anyone can travel

ANSWER:

d

POINTS:

1

QUESTION TYPE:

Multiple Choice

HAS VARIABLES:

False

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2. The danger zone around the robot is _____.

- a. the same as the work envelope for the robot
- b. where OSHA requires you to have an E-stop in reach at all times
- c. the area where the robot can reach
- d. All of these are correct

ANSWER:

d

POINTS:

1

QUESTION TYPE:

Multiple Choice

HAS VARIABLES:

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3. The cautionary zone around the robot is _____.

- a. where you are close to the robot, but out of its reach
- b. safe for anyone to travel or work
- c. where the operator often works
- d. Both a and c are correct

ANSWER:

d

POINTS:

1

QUESTION TYPE:

Multiple Choice

HAS VARIABLES:

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4. Which of the following is the most life-threatening path for electricity to take as it passes through the body?

- a. Fingertip to middle of the same hand
- b. From the middle of the left hand to the left foot

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- c. From the middle of the hand to the same shoulder
- d. None of these are correct

ANSWER: b
POINTS: 1
QUESTION TYPE: Multiple Choice
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5. Tourniquets _____.
- a. should be used with all bleeding
 - b. are used as a last resort
 - c. present no danger to the patient
 - d. require no special training for use

ANSWER: b
POINTS: 1
QUESTION TYPE: Multiple Choice
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6. What would be the amperage of a system that is powered by 120 volts and has a resistance of 100 ohms?
- a. 1.2 amps
 - b. 0.5 amp
 - c. 1 amp
 - d. 12 amps

ANSWER: a
POINTS: 1
QUESTION TYPE: Multiple Choice
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7. What is the resistance of a system that is powered by 480 volts and has 60 amps flowing through it?
- a. 5.8 ohms
 - b. 10 ohms
 - c. 13.5 ohms
 - d. 8 ohms

ANSWER: d

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POINTS: 1
QUESTION TYPE: Multiple Choice
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8. At _____, muscle contractions and breathing difficulty *begin* with loss of muscle control possible.
- a. 0.010A to 0.030A
 - b. 0.100A to 0.200A
 - c. 2.0A to 4.0A
 - d. None of these are correct

ANSWER: a
POINTS: 1
QUESTION TYPE: Multiple Choice
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9. Ventricular fibrillation is highly possible when _____ passes through the heart.
- a. 0.001A to 0.003A
 - b. 0.010A to 0.030A
 - c. 0.100A to 0.200A
 - d. None of these are correct

ANSWER: c
POINTS: 1
QUESTION TYPE: Multiple Choice
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10. What is your internal resistance to electricity once it makes it under your skin and passes from your hand to your foot?
- a. 200,000 ohms
 - b. 400 to 600 ohms
 - c. 2000 ohms
 - d. 600,000 ohms

ANSWER: b
POINTS: 1
QUESTION TYPE: Multiple Choice
HAS VARIABLES: False

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11. Sensors that house an emitter and a receiver separately to create an infrared sensing barrier are known as a _____.

- a. limit switch
- b. proximity switch
- c. light curtain
- d. pressure sensor

ANSWER: c

POINTS: 1

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

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12. What is a zero-energy state?

- a. When there is no active power
- b. When the electrical power is turned off
- c. When there is no latent power
- d. Both a and c are correct

ANSWER: d

POINTS: 1

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

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13. The person who can remove a lock on a lockout device is _____.

- a. the person who put it in place
- b. the supervisor once the work is done
- c. the supervisor once he or she has spoken with the owner
- d. Both a and c are correct

ANSWER: d

POINTS: 1

QUESTION TYPE: Multiple Choice

HAS VARIABLES: False

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14. The LOTO standard _____.
- a. is an OSHA standard that took effect on January 2, 1990
 - b. prevents approximately 120 fatalities per year
 - c. is your best protection when working on equipment
 - d. All of these are correct

ANSWER: d
POINTS: 1
QUESTION TYPE: Multiple Choice
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15. What are the three Rs of robotics, and what do they mean?

ANSWER: Robots Require Respect
This means that those working around robots need to be cautious and aware at all times as robots are often faster and stronger than humans.
POINTS: 2
QUESTION TYPE: Subjective Short Answer
PE:
HAS VARIABLE: False
S:
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D:
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ED:

16. List three alarm conditions that will stop the robot if it is running or prevent start up.

ANSWER: Alarms related to things such as safety sensors, E-stops, load on the motors, vision systems, and other devices that give the robot information about the world around it and what is going on with its internal systems
POINTS: 2
QUESTION TYPE: Subjective Short Answer
PE:
HAS VARIABLE: False
S:
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ED:

17. What events stop the robot when it is performing program tasks?

ANSWER: The program/driven action is finished, an alarm condition occurs, or mechanical failure arises

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POINTS: 2

QUESTION TYPE: Subjective Short Answer

HAS VARIABLES: False

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18. What factors determine the severity of a shock?

ANSWER: The amount of current that passes through the body, the path the electricity takes through the body, and the duration of the shock

POINTS: 2

QUESTION TYPE: Subjective Short Answer

PE:

HAS VARIABLE: False

S:

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D:

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ED:

19. What are the steps of the LOTO process, in order they are executed?

ANSWER:

1. Notify affected individuals you are about to shut the machine down. This includes operators, employees nearby, and management.
2. Stop the machine cycle, if necessary.
3. Turn off or remove all external power supplies and lock them in the off position using lockout devices and a lock with your name on it.
4. Place appropriate information tags on the equipment, such as "Do Not Run, Under Maintenance."
5. Verify a zero-energy state. Make sure to account for capacitors, compressed springs, items that could fall, stored fluid pressures, or other potential energy sources.
6. Perform the necessary repairs.
7. Once the repairs are finished, remove all tools and any blocking devices or other items you added to the machine for safety reasons.
8. Once everything is clear, each person working on the robot should remove his or her own lock. The last person can return power to the equipment.

POINTS: 3

QUESTION TYPE: Essay

PE:

HAS VARIABLE: False

S:

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ED:

20. What are the four general rules of handling emergencies and what is your responsibility for each? Make sure you support your answers fully.

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ANSWER: General rule #1: Remain calm. You should make sure not to say or do anything that will make the injured person more upset or focus on the severity of the situation.
General rule #2: Assess the situation. Determine what the dangers are, what the injuries are, and what needs to be done first.
General rule #3: Perform to the level of your training. Perform only those tasks you are trained for and not something seen in a movie or on TV, as that could make matters worse.
General rule #4: After it is over, talk it out. Often emergencies are stressful situations and those involved with helping find it beneficial to talk about what happened with someone after it is over. This is also a good time to review what was done and look for ways to improve responses.

POINTS: 3

QUESTION TYPE: Essay

PE:

HAS VARIABLE: False

S:

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ED: