



Pre Evaluation Systems Control 2005



Directions For Numbers 1-25 : Read each of the following multiple-choice items and the possible answers carefully. Mark the letter of the correct answer on your answer sheet or as instructed by your teacher. Remember: Make no marks on this test.

1

When using a stepper motor to drive a conveyor belt, what would increase the speed of the conveyor belt?

- A Increasing the output voltage
- B Decreasing the output voltage
- C Increasing the frequency of pulses
- D Decreasing the frequency of pulses

2

If a linear actuator moves an external load, the work done by the actuator on the external load is:

- A Linear mechanical work.
- B Linear fluid work.
- C Angular fluid work.
- D Angular mechanical work.

3

What type of device is a sensor?

- A Input
- B Process
- C Output
- D Feedback

4

Closed-loop systems are self-correcting where information about the output performance controls the process. This information is known as:

- A Input.
- B Process.
- C Output.
- D Feedback.

5

The use of machines to control machines is called:

- A Cybernetics
- B Automation
- C Circuit logic
- D PLC

6

Electrical sensors that convert non-electrical conditions into electrical values are:

- A Motors.
- B Actuators.
- C Transducers.
- D Solenoids.

7

Interpreting the signal from a sensor is which step in a closed-loop system?

- A Input
- B Process
- C Output
- D Feedback

8

The work done by a moving piston is equal to the force multiplied by the:

- A Piston area.
- B Volume of the piston.
- C Piston stroke.
- D Piston diameter.

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- 9** Pneumatic and hydraulic cylinders may be classified as:
- A Rotary drives.
 - B Interfaces.
 - C Mechanical sensors.
 - D Linear actuators.
- 10** All fluid systems can be classified as either:
- A Solid or liquid.
 - B Hydraulic or liquid.
 - C Pneumatic or gas.
 - D Pneumatic or hydraulic.
- 11** Sequence, timing and logic are the primary actions in a:
- A Conveyor.
 - B Output.
 - C Process Control.
 - D Input.
- 12** A mechanical device commonly used as a mechanical timer is the:
- A Cam.
 - B Pulley.
 - C Wedge.
 - D Lever.
- 13** What is the first step in the DEAL problem solving method?
- A Determine the possible solutions
 - B Decide on a solution
 - C Define the problem
 - D Describe evaluation methods
- 14** A device used to measure an environmental or physical condition is known as a(n):
- A Interface.
 - B Sensor.
 - C Actuator.
 - D Motor.
- 15** Logic is a set of rules for the interface to:
- A Control.
 - B Make decisions.
 - C Configure.
 - D Sense.
- 16** A 20 lb force applied to the end of a 1.5 ft wrench produces a torque of:
(Use the following equation: $T = F \times l$)
- A 13.33 lb·ft
 - B 30 lb·ft
 - C 40 lb·ft
 - D 300 lb·ft
- 17** Two-hundred Newtons of force are required to lift a mass 1.2 meters above the floor. How many Newton-meters of work is done? (Use the following equation: $W = F \times l$)
- A 60
 - B 120
 - C 240
 - D 480

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- 18** A jack that lifts 100 lbs and has a lifting piston with an area of 0.5 in^2 will have what fluid pressure in psi?
(Use the following equation: $P = F/A$)
- A 0.005
 - B 0.5
 - C 200
 - D 5000
- 19** A CNC machine utilizes the Cartesian coordinate system to drill two holes. Point A is located at (-2,-3) and Point B at (4,3). The distance between the two holes can be calculated using a version of the Pythagorean Theorem called the distance formula. The distance formula is expressed as
- $$d = \sqrt{(X_a - X_b)^2 + (Y_a - Y_b)^2} .$$
- Approximately, what is the distance between Point A and B?
- A 2.32
 - B 8.485
 - C 8.602
 - D 72
- 20** Slope is the ratio of the change in Y to the change in X. If $X = 8$ and $Y = 3$, what is the slope?
- A 0.375
 - B 0.667
 - C 2.667
 - D 6.375
- 21** Output devices convert signals into a form of:
- A Pneumatics.
 - B Electricity.
 - C Force.
 - D Energy.
- 22** The system used to quantify spatial relationships is?
- A Cartesian
 - B Control
 - C Math
 - D Mechanical
- 23** Pressure is equal to:
- A Force divided by area.
 - B Area divided by force.
 - C Force times area.
 - D Force time volume.
- 24** Torque is the measure of what kind of force?
- A Diagonal
 - B Vertical
 - C Lateral
 - D Rotational
- 25** Work is equal to:
- A Force plus distance.
 - B Force minus distance.
 - C Force multiplied by distance.
 - D Force divided by distance.

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| ? | ⊙ | Answer/ Scale | Objective |
|----|----|------------------|--------------------|
| 1 | 1 | C | SC19.03 Technology |
| 2 | 2 | A | SC19.03 Technology |
| 3 | 3 | A | SC19.03 Technology |
| 4 | 4 | D | SC19.03 Technology |
| 5 | 5 | B | SC19.03 Technology |
| 6 | 6 | C | SC19.03 Technology |
| 7 | 7 | B | SC19.03 Technology |
| 8 | 8 | C | SC19.03 Technology |
| 9 | 9 | D | SC19.03 Technology |
| 10 | 10 | D | SC19.03 Technology |
| 11 | 11 | C | SC19.03 Technology |
| 12 | 12 | A | SC19.03 Technology |
| 13 | 13 | C | SC19.03 Technology |

| ? | ⊙ | Answer/ Scale | Objective |
|----|----|------------------|--------------------|
| 14 | 14 | B | SC19.03 Technology |
| 15 | 15 | B | SC19.03 Technology |
| 16 | 16 | B | SC19.01 Math |
| 17 | 17 | C | SC19.01 Math |
| 18 | 18 | C | SC19.01 Math |
| 19 | 19 | B | SC19.01 Math |
| 20 | 20 | A | SC19.01 Math |
| 21 | 21 | D | SC19.02 Science |
| 22 | 22 | A | SC19.02 Science |
| 23 | 23 | A | SC19.02 Science |
| 24 | 24 | D | SC19.02 Science |
| 25 | 25 | C | SC19.02 Science |

Minimum points
required to achieve
mastery category

Total questions on test: 25

| Objectives measured: 3 | Items | Points | ● | ☾ | Questions measuring this objective |
|------------------------|-------|--------|----|----|------------------------------------|
| SC19.03 Technology | 15 | 15 | 11 | 10 | 1 2 3 4 5 6 7 8 9 10 11 |
| SC19.03 Technology | | | | | 12 13 14 15 |
| SC19.01 Math | 5 | 5 | 4 | 3 | 16 17 18 19 20 |
| SC19.02 Science | 5 | 5 | 4 | 3 | 21 22 23 24 25 |
| Totals | | 25 | 19 | 16 | |

SC19

? = Test Question Number ⊙ = line on GP Form

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Items used in test

| ? | Item name | ? | Item name | ? | Item name |
|---|---------------|----|---------------|----|---------------|
| 1 | SC19.03.00.12 | 10 | SC19.03.00.11 | 18 | SC19.01.00.03 |
| 2 | SC19.03.00.01 | 11 | SC19.03.00.07 | 19 | SC19.01.00.04 |
| 3 | SC19.03.00.02 | 12 | SC19.03.00.15 | 20 | SC19.01.00.05 |
| 4 | SC19.03.00.06 | 13 | SC19.03.00.10 | 21 | SC19.02.00.03 |
| 5 | SC19.03.00.09 | 14 | SC19.03.00.04 | 22 | SC19.02.00.01 |
| 6 | SC19.03.00.03 | 15 | SC19.03.00.08 | 23 | SC19.02.00.05 |
| 7 | SC19.03.00.13 | 16 | SC19.01.00.01 | 24 | SC19.02.00.02 |
| 8 | SC19.03.00.14 | 17 | SC19.01.00.02 | 25 | SC19.02.00.04 |
| 9 | SC19.03.00.05 | | | | |

SC19

? = Test Question Number ● = line on GP Form