TI25 - Pre-Instructional Survey

Name: _____Date: _____

1. Scheduled maintenance that is planned, with materials on hand, personnel on site, and production planning advised is called _____ maintenance.

   a. predictive
   b. preventive
   c. corrective
   d. troubleshooting

2. What standard defining quality policy and procedures is recognized as the “de facto” requirement for doing business in Europe?

   a. ISA12.11
   b. ISO 9000
   c. NFPA: 70-84
   d. CENELEC

3. How is a transmitter’s current output signal converted to a voltage-input signal required by an electronic controller?

   a. a resistor is placed across the input terminals of the controller
   b. all wiring in the loop is tied positive-to-negative
   c. a forward bias diode is placed between the transmitter and controller
   d. a capacitor is placed across the output terminals of the transmitter

4. An analog electronic d/p transmitter has an output of 4-20 mA which represents 0 to 100 gpm (0 to 378.5 lpm). On a properly calibrated transmitter, what is the output in gpm (lpm), if the transmitter output is 12 mA?

   a. 25 (94 lpm)
   b. 33.3 (126 lpm)
   c. 70.7 (267.6 lpm)
   d. 50 (189.3 lpm)

5. A test instrument (standard) against which the accuracy of all others are compared is referred to as a _____ standard.

   a. primary
   b. secondary
   c. shop
   d. ISA

6. During calibration of a differential pressure transmitter it was determined that the ideal value at 100% of span was 20 mA, the as found value was 20.04 mA. Knowing that the span of the ideal values is 16, what is the PERCENT DEVIATION?

   a. 0%
   b. .0625%
   c. .1875%
   d. .25%

7. This calibration chart was completed during the calibration of an electronic d/p transmitter. An analysis of the data indicates that a _____ error was found.

   a. zero
   b. span
   c. linearity
   d. hysteresis

INPUT VALUES		OUTPUT VALUES						
% of Span	Actual Input 0 to 150" H_2O (Span = 150")	Ideal Values	As Found Values ↓	As Found Values ↑	% Deviation (Error) ↓	% Deviation (Error) ↑	Calibration 1 ↓	Calibration 1 ↑
0%	0"	4 mA	4 mA	4 mA	0%	0%	4 mA	4 mA
25%	37.5"	8 mA	8.01 mA	8.01 mA	.0625%	.0625%	8 mA	8 mA
50%	75"	12 mA	12.02 mA	12.02 mA	.125%	.125%	12 mA	12 mA
75%	112.5"	16 mA	16.03 mA	16.03 mA	.1875%	.1875%	16 mA	16 mA
100%	150"	20 mA	20.04 mA	20.04 mA	.25%	.25%	20 mA	20 mA

8. Reviewing the information on the calibration chart in question 7 above, it is evident that the error was _____.

   a. uncorrected
   b. partially corrected
   c. corrected
   d. converted

9. When calibrating a RTD temperature transmitter, which device could be connected to the transmitter's input terminals to simulate the RTD probe signal?

   a. resistance decade box
   b. milliamp meter
   c. frequency generator
   d. oscilloscope

10. In a level control system using a capacitance probe as the sensor, if the process liquid medium changes:

    a. the transmitter will need to be recalibrated.
    b. the probe's grounding system will need to be relocated.
    c. adaptive control action will need to be added to the controller.
    d. there should be no effect on the control loop performance.

11. The function of an A/D converter in a "smart" transmitter is to:

    a. convert input power from ac to dc
    b. convert output power from dc to ac
    c. convert the input analog signal to digital format
    d. convert the output digital signal to analog format

12. The procedure that allows you to change a "smart" transmitter's parameters such as tag, engineering units output type (linear/square root), damping, etc. is:

    a. digital trim
    b. a/d conversion
    c. configuration
    d. characterization

13. A typical location for an I/P transducer in an electronic control loop would be:

    a. between the sensor and controller.
    b. between the controller and the control valve.
    c. at the measurement point in the process.
    d. at the control point in the process.

14. The time between the initiation of an input change and the start of the resulting change in an instrument's output signal response is called:

    a. reset time
    b. real time
    c. function time
    d. dead time

15. If the proportional band on a controller is 100%, then the controller gain is equal to:

    a. 0.50
    b. 0.20
    c. 1
    d. 100

16. What type of control mode is usually added to a proportional controller to eliminate offset?

    a. derivative (rate) control
    b. on/off control
    c. integral (reset) control
    d. cascade control

17. If the controller you have installed is set as _____ acting, an increase in measurement (process variable) causes the controller output to increase.

    a. direct
    b. reverse
    c. proportional
    d. on/off

18. A Zone (in NEC terminology) is the same type of area classification designator as a _____ .

    a. class
    b. group
    c. division
    d. circuit isolator

19. On a P&ID, what type of instrument is indicated by the tag number FT-100?

    a. flow indicating controller
    b. series 100 flow transducer
    c. flow transmitter
    d. flow control valve

20. The proper method for field mounting an instrument, connecting it to the process, and positioning it for proper operation would most likely be found on the:

    a. P&ID
    b. instrument index
    c. process flow diagram
    d. installation detail drawing

21. Ideally, a control system is grounded:

    a. at every field mounted instrument.
    b. every 25 feet in the loop.
    c. every 50 feet in the loop.
    d. at a single location near the control room or panel.

22. In the National Electrical Code (NEC) and relevant ISA Standards classification system for hazardous areas, a _____ designation indicates an area where hazardous concentrations exist under normal conditions.

    a. Group D or Group IIA
    b. Division 1 or Zone 0 or 1
    c. Class III or Group III, Zone 20, 21, or 22
    d. Group A or Group IIC

23. There are three factors necessary for an explosion to occur due to the presence of electrical equipment. Which of the following is NOT one of those factors?

    a. ignition source
    b. > 110 amps
    c. fuel
    d. oxidizer

24. The purpose of an intrinsic safety barrier is to:

    a. provide a physical obstruction between the hazardous and nonhazardous areas.
    b. establish a central grounding point in the hazardous area.
    c. prevent excess voltage or current from reaching the hazardous area.
    d. increase the resistance in the circuit to reduce the risk of explosion.

25. _____ typically represents a process response curve indicating “good” control and a properly tuned loop:

    a. A one-quarter decay ratio.
    b. An offset of < 25%.
    c. A one-half enhanced ratio.
    d. A steady-state gain of 0.5.

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1. b. preventive
2. b. ISO 9000
3. a. a resistor is placed across the input terminals of the controller
4. c. 70.7 (267.6 lpm)
5. a. primary
6. d. .25%
7. b. span
8. c. corrected
9. a. resistance decade box
10. a. the transmitter will need to be recalibrated
11. c. convert the input analog signal to digital format
12. c. configuration
13. b. between the controller and the control valve.
14. d. dead time.
15. c. 1
16. c. integral (reset) control
17. a. direct
18. c. division
19. c. flow transmitter
20. d. installation detail drawing
21. d. at a single location near the control room or panel.
22. b. Division 1 or Zone 0 or 1
23. b. > 110 amps
24. c. prevent excess voltage or current from reaching the hazardous area.
25. a. a one-quarter decay ratio.