

# EI05 - Pre-Instructional Survey

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Which of the following is not a unit for pressure measurement?
  - a. pascal
  - b. PSI
  - c. IN.WC
  - d. IN.Hg
  - e. FPS
  
2. Which of the following expresses the lowest pressure measurement value?
  - a. 1 pascal
  - b. 1 PSI
  - c. 1 IN.WC
  - d. 1 IN.Hg
  - e. 1 FPS
  
3. One inch of water column is equal to:
  - a. .036 PSI.
  - b. 27.7 IN Hg.
  - c. .433 PSI.
  - d. 13.6 IN #3 red oil.
  3. one atmosphere.
  
4. A common input transducer for a differential pressure transmitter is:
  - a. "C" tube.
  - b. diaphragm capsule.
  - c. diaphragm.
  - d. helical.
  - e. spiral.
  
5. List the device that is not a common output transducer for an electronic pressure transmitter:
  - a. capacitance.
  - b. LVDT.
  - c. strain gage.
  - d. vibrating conductor.
  - e. flapper-nozzle.

6. A differential pressure transmitter is calibrated for 0-100 W.C. and the output range is 4-20 mA. When 36" differential is applied to the transmitter, the correct output is:
- 8.27 mA.
  - 5.76 mA.
  - 10.26 mA.
  - 12.27 mA.
  - 9.76 mA.
7. Select the following true statement.
- A wet leg on the high side of a d/p level transmitter requires elevation.
  - A wet leg on the low side of a d/p level transmitter requires suppression.
  - A wet leg on either side requires a liquid seal.
  - Remote diaphragms can be used to eliminate wet legs.
  - Wet legs are more common with pressure applications than with differential applications.
8. Select the following true statement.
- Visual level measurement techniques find few applications because they are mostly obsolete and provide no transmission.
  - Sight glasses are seldom used in closed tank applications above 30 PSI.
  - ATG describes a system that produces a measurement from which the volume and/or weight liquid in a vessel can be calculated.
  - Level measurement systems are seldom accurate enough for volume determinations.
  - Float and tape devices are excellent primary devices for level measurement and transmission.
9. Select the following true statement.
- Displacers are classified as visual measurement devices.
  - Torque tube displacers are giving way to displacers with magnetic coupling.
  - A common application for displacers is interface measurement.
  - Displacers find little applications in closed tanks.
  - An advantage of displacer level measurement is the disregard of specific gravity considerations.

10. Select the equation that relates to hydrostatic level measurement.
- $P = 0.433 \text{ PSI/ft. (G)(H)}$
  - $1 \text{ PSI} = 2.41 \text{ ft. W.C.} = 27.7 \text{ in W.C.}$
  - $P = 0.433 \text{ PSI/2.3 ft.} = 0.188 \text{ PSI/in.}$
  - $P = FA$
  - $P=61.386\#/141.8 \text{ in.}^2 = 0.433 \text{ PSI/ft.}$
11. A common signal conditioning circuit for resistance tape level sensors is:
- AC Wheatstone Bridge.
  - DC Wheatstone Bridge.
  - discriminator circuit.
  - a diode detector.
  - a capacitance bridge circuit.
12. Bubble or dip tubes are used to:
- aerate water.
  - overcome mounting difficulties in displacers.
  - overcome mounting difficulties in head measurement.
  - maintain blanket pressure in closed tank applications.
  - measure level in closed tanks.
13. Select the true statement for capacitance level measurement.
- This method is independent of the dielectric constant.
  - Can only be used with non-conductive tank material.
  - Is immune to static pressure and temperature.
  - Can be used for point applications only.
  - Susceptible to error caused by agitation and splashing.
14. Select the true statement for ultrasonic level measurement.
- Generally cost competitive with most other level technologies.
  - Immune to error caused by static pressure and temperature.
  - May have non-invasive applications.
  - Has wetted moving parts.
  - Cannot be used for interface applications.

15. To measure density in a pipe section, which density-measuring device is a good application?
- ball type
  - Coriolis
  - hydrometers
  - displacer
  - radar
16. Select the formula that relates to hydrostatic density measurement.
- $P = 0.433 \text{ PSI/ft. } (D)(H)$
  - $P = (H)(L)(G)$
  - $\text{SPAN} = H (G_1 - G_2)$
  - $\text{ELEVATION} = (H)(G_1)$
  - $\text{SUPPRESSION} = H (G_3 - G_1)$
17. Select the value not required for HTG applications.
- tank calibration
  - calculated values
  - pressure measurement
  - temperature measurement
  - weight measurement
18. Select the variable not provided by HTG calculation.
- net volume
  - level
  - density
  - mass
  - tank height
19. Select the statement that does not represent an advantage of HTG.
- Level measurement accuracy of .1 to .2 inches is possible.
  - No wetted moving parts.
  - On-line density measurement is provided.
  - It is a mass based measurement system.
  - Accurate inventory measurement and leak detection is possible.

20. Select the following true statement.
- a. Smart transmitters are most often used for fieldbus applications.
  - b. Most present application for smart transmitters uses analog transmission.
  - c. Disregarding the type of transmission, there is little advantage for smart transmitters.
  - d. Most smart transmitter applications are with all digital devices.
  - e. Smart transmitter technology is slow to “catch on” because of application engineering and maintenance cost.

## EI05 - Pre-Instructional Survey Answer Sheet

1. e
2. a
3. a
4. b
5. e
6. e
7. d
8. c
9. c
10. a
11. b
12. c
13. e
14. c
15. b
16. c
17. e
18. e
19. a
20. b