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.
   e. 1 atmosphere.

4. A common input transducer for a differential pressure transmitter is:
   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:

a. 8.27 mA.
b. 5.76 mA.
c. 10.26 mA.
d. 12.27 mA.
e. 9.76 mA.

7. Select the following true statement.

a. A wet leg on the high side of a d/p level transmitter requires elevation.
b. A wet leg on the low side of a d/p level transmitter requires suppression.
c. A wet leg on either side requires a liquid seal.
d. Remote diaphragms can be used to eliminate wet legs.
e. Wet legs are more common with pressure applications than with differential applications.

8. Select the following true statement.

a. Visual level measurement techniques find few applications because they are mostly obsolete and provide no transmission.
b. Sight glasses are seldom used in closed tank applications above 30 PSI.
c. ATG describes a system that produces a measurement from which the volume and/or weight liquid in a vessel can be calculated.
d. Level measurement systems are seldom accurate enough for volume determinations.
e. Float and tape devices are excellent primary devices for level measurement and transmission.

9. Select the following true statement.

a. Displacers are classified as visual measurement devices.
b. Torque tube displaces are giving way to displacers with magnetic coupling.
c. A common application for displacers is interface measurement.
d. Displacers find little applications in closed tanks.
e. An advantage of displacer level measurement is the disregard of specific gravity considerations.
10. Select the equation that relates to hydrostatic level measurement.

a. \[ P = 0.433 \text{ PSI/ft.} \ (G)(H) \]
b. \[ 1 \text{ PSI} = 2.41 \text{ ft. W.C.} = 27.7 \text{ in W.C.} \]
c. \[ P = 0.433 \text{ PSI/2.3 ft.} = 0.188 \text{ PSI/in.} \]
d. \[ P = FA \]
e. \[ P = \frac{61.386\#}{141.8 \text{ in.}^2} = 0.433 \text{ PSI/ft.} \]

11. A common signal conditioning circuit for resistance tape level sensors is:

a. AC Wheatstone Bridge.
b. DC Wheatstone Bridge.
c. discriminator circuit.
d. a diode detector.
e. a capacitance bridge circuit.

12. Bubble or dip tubes are used to:

a. aerate water.
b. overcome mounting difficulties in displacers.
c. overcome mounting difficulties in head measurement.
d. maintain blanket pressure in closed tank applications.
e. measure level in closed tanks.

13. Select the true statement for capacitance level measurement.

a. This method is independent of the dielectric constant.
b. Can only be used with non-conductive tank material.
c. Is immune to static pressure and temperature.
d. Can be used for point applications only.
e. Susceptible to error caused by agitation and splashing.

14. Select the true statement for ultrasonic level measurement.

a. Generally cost competitive with most other level technologies.
b. Immune to error caused by static pressure and temperature.
c. May have non-invasive applications.
d. Has wetted moving parts.
e. Cannot be used for interface applications.
15. To measure density in a pipe section, which density-measuring device is a good application?
   a. ball type
   b. Coriolis
   c. hydrometers
   d. displacer
   e. radar

16. Select the formula that relates to hydrostatic density measurement.
   a. \( P = 0.433 \text{ PSI/ft.} \, (D)(H) \)
   b. \( P = (H)(L)(G) \)
   c. \( \text{SPAN} = H \, (G_1 - G_2) \)
   d. \( \text{ELEVATION} = (H)(G_1) \)
   e. \( \text{SUPPRESSION} = H \, (G_3 - G_1) \)

17. Select the value not required for HTG applications.
   a. tank calibration
   b. calculated values
   c. pressure measurement
   d. temperature measurement
   e. weight measurement

18. Select the variable not provided by HTG calculation.
   a. net volume
   b. level
   c. density
   d. mass
   e. tank height

19. Select the statement that does not represent an advantage of HTG.
   a. Level measurement accuracy of .1 to .2 inches is possible.
   b. No wetted moving parts.
   c. On-line density measurement is provided.
   d. It is a mass based measurement system.
   e. 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