Visit Suncam.com for more courses

Continuing Education Course #409
Understanding Sensors Part 1
Sensor Technology

1. Sensors are a system consisting of a sensing element, processing and conditioning, plus what other elements?
- ○ a. output display and or communication link
- ○ b. power supply
- ○ c. both A and B

2. Sensors normally provide some measure of what energy quantity?
- ○ a. electrical, mechanical, thermal, chemical
- ○ b. light intensity, biological, or magnetic
- ○ c. both A and B

3. Sensors operating modes are?
- ○ a. pressure and temperature
- ○ b. passive and active
- ○ c. flow and level

4. MEMS is an acronym for?
- ○ a. miniature electronic min-system
- ○ b. modular electronic mini-sensor
- ○ c. micro electro-mechanical system

5. Sensors performance is defined by what performance metric?
- ○ a. accuracy
- ○ b. dynamic range
- ○ c. operating mode

6. This sensor performance is a function of what other parameters?
- ○ a. sensitivity, resolution, repeatability, dynamic range
- ○ b. dynamic range, response time, signal to noise ratio (SNR)
- ○ c. both A and B

7. Sensor performance can be improved with a sophisticated filtering algorithm called?
- ○ a. The Coriolis filter
- ○ b. The Sagnac filter
- ○ c. The Kalman filter

8. a bimetallic switch uses the difference in what characteristic of two metals to create a bending motion?
- ○ a. thermal expansion coefficient
- ○ b. density
- ○ c. surface smoothness

9. RTD is an acronym for?
- a. real time detector
- b. resistive temperature device
- c. relative temperature device

10. A thermistor measures the change in resistance of a semiconductor material due to?
- a. pressure
- b. a magnetic field
- c. temperature

11. A thermocouple uses what effect to sense temperature change?
- a. Sagnac Effect
- b. Kalman Effect
- c. Seebeck Effect

12. Common types of optical detectors include?
- a. pressure and temperature resistive
- b. Photoconductive, photovoltaic, and photo resistive
- c. Coriolis detectors

13. Most camera arrays use what pixel detector technologies?
- a. CCD and CMOS
- b. RTD and RLG
- c. LVDT and FOG

14. Inductive proximity sensors use the principles of what law for detection?
- a. Hall's Law
- b. Newton's Law
- c. Faraday's Law

15. Inductive sensors work with what type of objects?
- a. all objects
- b. metallic objects only
- c. metallic and plastic objects

16. Capacitive proximity sensors are used with type of objects?
- a. metallic and non-metallic objects
- b. plastic objects only
- c. metallic objects only

17. Resolver, encoders, and potentiometers, LVDT, and Hall Effect are what type of sensors?
- a. position
- b. pressure
- c. inertial rate

18. What do resolvers use to generate angular position?
- a. windings similar to motors
- b. rotating optical disk
- c. free running oscillator

19. Resolvers are what type of position sensors?

- ○ a. relative only
- ○ b. absolute only
- ○ c. absolute and relative

20. What do encoders use to generate a pulse train whose count is proportional to position?
- ○ a. windings similar to motors
- ○ b. oscillator
- ○ c. rotating optical disk

21. Encoders are what type of position sensors?
- ○ a. relative only
- ○ b. absolute only
- ○ c. absolute and relative

22. Potentiometers are?
- ○ a. very accurate and low cost
- ○ b. not very accurate and low cost
- ○ c. very accurate and expensive

23. A gyro measures?
- ○ a. inertial rate
- ○ b. relative angular position
- ○ c. relative angular acceleration

24. Ring Laser Gyros and Fiber Optic Gyros both use what effect?
- ○ a. Seebeck Effect
- ○ b. Sagnac Effect
- ○ c. Faraday's Effect

25. An inertial measurement unit includes how many of each gyros and accelerometers?
- ○ a. one
- ○ b. two
- ○ c. three