



ST. ANNE'S

COLLEGE OF ENGINEERING AND TECHNOLOGY

OAN551 – SENSORS AND TRANSDUCERS

UNIT 2 – MOTION, PROXIMITY AND RANGING SENSOR

1. Which sensor can detect nearby objects?

- a) **Proximity sensor**
- b) Humidity sensor
- c) Touch sensor
- d) Pressure sensor

2. The monitoring of machines, gears and objects are achieved by which sensor?

- a) Humidity sensor
- b) **Proximity sensor**
- c) Touch sensor
- d) Pressure sensor

3. Which proximity sensor detects metal objects?

- a) Capacitive Proximity Sensor
- b) Magnetic Proximity Sensor
- c) Ultrasonic Proximity Sensor
- d) **Inductive Proximity Sensor**

4. Which proximity sensor indicates level?

- a) **Inductive Proximity Sensor**
- b) Capacitive Proximity Sensor
- c) Magnetic Proximity Sensor
- d) Ultrasonic Proximity Sensor

5. Which proximity sensors are used in automotive?

- a) Inductive Proximity Sensor
- b) Capacitive Proximity Sensor
- c) Magnetic Proximity Sensor
- d) **Ultrasonic Proximity Sensor**

6. Which proximity sensor detects positioning of an object?

- a) Inductive Proximity Sensor
- b) Capacitive Proximity Sensor

c) Optical Proximity Sensor

d) Magnetic Proximity Sensor

7. Which protocol is used by proximity sensor?

a) I2C

b) SPI

c) UART/USART

d) CAN

8. Which device generates output signal when metal objects are either inside or entering into sensing area.

a) Capacitive Proximity

b) Magnetic Proximity

c) Inductive proximity

d) Parallel Proximity

9. _____ sensors have no electrical noise effect and it can work DC.

a) Inductive proximity

b) Capacitive Proximity

c) Magnetic Proximity

d) Parallel Proximity

10. What is the sensing range for capacitive proximity sensors?

a) 150mm

b) 25mm

c) 120mm

d) 100mm

11. The type of sensor that detects the analyte species directly through their characteristic spectral properties is called _____

a) chemical sensor

b) thermal sensor

c) light sensor

d) spectroscopic Sensors

12. Capacitance of a parallel plate capacitor is _____

a) $C = \frac{A\epsilon}{d}$

b) $C = \frac{\epsilon}{d}$

c) $C = \frac{A}{d}$

d) $C = A$

13. A capacitive transducer works on the principle of _____

a) inductance

b) capacitance

c) resistance

d) reluctance

14. Capacitance can be varied in _____

a) 10 ways

b) 6 ways

c) 2 ways

d) 4 ways

15. Capacitive pressure transducer uses distance of separation for sensing the capacitance.

a) True

b) False

16. Capacitive transducer displays _____

a) linear behaviour

b) non-linear behaviour

c) exponential behaviour

d) tangential behavior

17. Frequency response of capacitive transducers is _____

a) high

b) medium

c) low

d) zero

18. What is the relation between capacitance and input impedance?

a) directly proportional

b) constant

c) proportional to square

d) inversely proportional

19. Composite capacitance consists of _____

a) one dielectric medium

b) more than one dielectric medium

c) five dielectric media

d) ten dielectric media

20. Capacitive transducers can be used by _____

a) Measuring change in distance between plates

b) Measuring change in area of plates

c) Change in a dielectric material

d) All of the mentioned

21. Capacitive transducers cannot be used as strain gauges.

- a) True
- b) False**

22. Which of the following is correct for the capacitive transducer?

- a) Capacitive strain gauges
- b) Capacitive tachometers
- c) Capacitive pressure transducer
- d) All of the mentioned**

23. For a material capacitance increases with _____

- a) Decrease in area of plates, all other factors constant
- b) Increase in distance between plates, all other factors constant
- c) Decrease in distance between plates, all other factors constant
- d) None of the mentioned**

24. Which of the following is correct for moisture transducers?

- a) Dielectric constant of pure water greater than other materials**
- b) Dielectric constant of pure water much less than other materials
- c) Dielectric constant of pure water and of other materials are equal
- d) None of the mentioned

25. Which of the following device is used for measuring relative humidity?

- a) Capacitive pressure transducer
- b) Hygrometer**
- c) Capacitive strain transducer
- d) Capacitive moisture transducer

26. Which of the following quantities cannot be measured by capacitive transducers?

- a) Displacement
- b) Speed
- c) Moisture
- d) None of the mentioned**

27. Which of the following have high relative permittivity?

- a) Bakelite
- b) Marble**
- c) Paraffin
- d) All of the mentioned

28. Thermometers are not possible using a capacitive transducer.

- a) True
- b) False**

29. Which of the following is not a characteristic of an ideal transducer?

- a) High dynamic range
- b) Low linearity**
- c) High repeatability
- d) Low noise

30. Which of the following represent active transducer?

- a) Strain gauge
- b) Thermistor
- c) LVDT
- d) Thermocouple**

31. Which transducer is known as ‘self-generating transducer’?

- a) Active transducer**
- b) Passive transducer
- c) Secondary transducer
- d) Analog transducer

32. What is the relation between scale factor and sensitivity of a transducer?

- a) Scale factor is double of sensitivity
- b) Scale factor is inverse of sensitivity**
- c) Sensitivity is inverse of scale factor
- d) Sensitivity is equal to scale factor

33. What is the principle of operation of LVDT?

- a) Mutual inductance**
- b) Self-inductance
- c) Permanence
- d) Reluctance

34. Which of the following can be measured using Piezo-electric transducer?

- a) Velocity
- b) Displacement
- c) Force**
- d) Sound

35. Capacitive transducer is used for?

- a) Static measurement
- b) Dynamic measurement**
- c) Transient measurement
- d) Both static and dynamic

36. Which of the following is used in photo conductive cell?

- a) **Selenium**
- b) Quartz
- c) Rochelle salt
- d) Lithium sulphate

37. Basically sound waves are _____

- a) Voltage signals
- b) **Pressure waves**
- c) Current
- d) Radiation

38. Which of the following is not a character of a sensor of a sound wave?

- a) Causes no health hazard
- b) They are suitable in a harsh environment
- c) **They are only suitable in cold environment**
- d) They can be used in corrosive environment

39. SONAR stands for _____

- a) **Sound navigation and ranging**
- b) Sound number approximation and ranging
- c) Sound nullifying ranging
- d) None of the mentioned

40. Which of the following type sound generators are not possible?

- a) Piezo electric
- b) Magnetostrictive
- c) Both piezo electric and magnetostrictive
- d) **None of the mentioned**

41. Piezo electric materials are well cut for _____

- a) Good dimension
- b) **Good coupling coefficient**
- c) Compact shape of device
- d) Increasing frequency

42. Which of the following can be used in sonar?

- a) ADP
- b) Rescelle salt
- c) ADP and Roscelle salt
- d) **ADP and Roscelle salt in sealed condition**

43. Magnetostriction transmitter uses _____

- a) Electrostrictive phenomena
- b) Horizontal vibration of nickel tube
- c) Longitudinal vibration of nickel tube**
- d) All of the mentioned

44. Which of the following can be affected by atmospheric path disturbances?

- a) Modern GPS surveying**
- b) Conventional GPS
- c) Absolute positioning
- d) Resection method

45. Which among the following can be described as an application of pseudo ranging?

- a) Computation of distance between satellite and user
- b) Computation of distance between GPS antenna and satellite**
- c) Computation of distance between GPS antenna and user
- d) Computation of distance between satellite and object

46. By using pseudo ranging method, two dimensional and three dimensional GPS positions can be located.

- a) True**
- b) False

47. Which of the following error occurs due to atmospheric conditions?

- a) Natural error
- b) User error
- c) Propagation error
- d) Signal multipath error**

48. Which of the following is not used in the tracking system?

- a) Multiple frequency**
- b) Dual frequency
- c) Single frequency
- d) Military navigation

49. Which of the following doesn't belong to the relative positioning techniques?

- a) Real-time kinematic technique
- b) Viscous GPS technique**
- c) Kinematic GPS surveying technique
- d) Differential GPS technique

50. Which of the following classes of positioning technique possess high precision?

- a) GPS**

- b) Viscous technique
- c) Real time technique
- d) Kinematic technique**

51. What will be the length of the base line in case of short baseline method of GPS surveying?

- a) Less than 50km**
- b) Greater than 50km
- c) Less than 2km
- d) Greater than 100km

52. Which of the following is considered as modern GPS technology?

- a) GIS
- b) GPS mode
- c) Instantaneous mode
- d) Kinematic positioning technique**