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Courses » Industrial Instrumentation

Unit 13 - Week 12

Course outline

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Lecture 29: Dissolved Oxygen Sensors - I

Lecture 30: Dissolved Oxygen Sensors - II

Quiz : Week-12 Assignment contain 1-mark MCQ questions on whole syllabus

Assignment Solution

Week-12 Assignment contain 1-mark MCQ questions on whole syllabus

1) A first-order system is subjected to a unit step-change in input. *1 point*
The time-constant of the instrument is 1 second. Find out the time-instant when error is maximum.

- a) at 0th second
- b) at 1 second
- c) at 2 second
- d) Insufficient data

Accepted Answers:

a) at 0th second

2) For a thermocouple pair (A,B), the extension wires (C,D): *1 point*

- (a) Should be identical pair elements
- (b) Should have identical temperature-emf relationship
- (c) Can be any two dissimilar materials
- (d) Should have very small temperature-emf sensitivity

Accepted Answers:

(b) Should have identical temperature-emf relationship

3) The processing circuit associated with an LVDT is a: *1 point*

- (a) Phase sensitive detector
- (b) charge amplifier
- (c) cold junction compensator
- (d) logarithmic amplifier

Accepted Answers:

(a) Phase sensitive detector

4) A pressure of the order of 10^{-10} cm of Hg can be measured by, *1 point*

- (a) Bellow
- (b) Pirani Gauge
- (c) Bourdon tube
- (d) Ionization gauge

Accepted Answers:

(d) Ionization gauge

5) When the input terminals of a pH meter are shorted, it will read **1 point**
pH value of:

- (a) 14
- (b) 0
- (c) 7
- (d) 9

Accepted Answers:

(c) 7

6) A pressure gauge measures a pressure as a gauge pressure of **1 point**
10 kPa. If the atmospheric pressure is 100 kPa, the absolute measured
pressure is,

- (a) 90 kPa
- (b) 100 kPa
- (c) 110 kPa
- (d) 10 kPa

Accepted Answers:

(c) 110 kPa

7) Differential arrangement for a capacitance transducer is **1 point**
preferred, because it:

- (a) reduces non-linearity
- (b) increase SNR
- (c) increase bandwidth
- (d) eliminated effect of cable capacitance

Accepted Answers:

(a) reduces non-linearity

8) The excitation voltage to an LVDT is a 10 kHz sinusoidal source. **1 point**
Assume that an ideal semiconductor diode bridge-based phase sensitive
demodulator circuit is used. Full range of core displacement is ± 20
mm. If the core of the LVDT remains static at 15mm above the ideal null
position, find the frequency of the voltage observed at the input of the
low-pass filter.

- (a) 20 kHz
- (b) 10 kHz
- (c) 5 kHz
- (d) 1 kHz

Accepted Answers:*(a) 20 kHz*

9) Polarogram is used for measurement of:

1 point

- (a) dissolved oxygen
- (b) pH
- (c) moisture
- (d) aerosol contamination

Accepted Answers:*(a) dissolved oxygen*

10) Which one of the following is a feature of a series thermopile?

1 point

- (a) reduces sensitivity
- (b) increases sensitivity
- (c) produces average output voltage
- (d) increases temperature range of measurement

Accepted Answers:*(b) increases sensitivity*

11) Which of the following is/are variable pressure type flowmeter?

1 point

- (a) Pitot tube
- (b) Flow Nozzle
- (c) Rotameter
- (d) Both (a) and (b)

Accepted Answers:*(d) Both (a) and (b)*

12) Weirs and flumes are generally preferred for-

1 point

- (a) Open channel flow measurement
- (b) Closed channel flow measurement
- (c) Both open and closed channel flow measurement

Accepted Answers:*(a) Open channel flow measurement*

13) Which of the following obstruction-type flowmeters causes highest pressure loss?

1 point

- (a) Venturi meter
- (b) Orifice meter
- (c) Flow nozzle based meter
- (d) Electromagnetic flowmeter

Accepted Answers:*(b) Orifice meter*

14) In a semiconductor strain gauge, for a tensile strain, the resistance of strain gauge will-

1 point

- (a) increase for N-type strain gauge
- (b) decrease for P-type strain gauge
- (c) increase for P-type strain gauge
- (d) increase for both P-type and N-type strain gauge

Accepted Answers:

(c) increase for P-type strain gauge

15) Semiconductor strain gauges have gauge factor in the order of -

1 point

- (a) 2
- (b) 10
- (c) 100
- (d) 1000

Accepted Answers:

(c) 100

16) A strain gauge experiences 2% change of resistance when subjected to a strain of 8000 micro. The gauge factor of the strain gauge is-

1 point

- (a) 2.0
- (b) 2.5
- (c) 200
- (d) 250

Accepted Answers:

(b) 2.5

17) For an optical fibre, the refractive index of core and cladding material are 1.641 and 1.422 respectively. The critical angle for total internal reflection is -

1 point

- (a) 60.06 deg
- (b) 30.03 deg
- (c) 90 deg
- (d) 0 deg

Accepted Answers:

(a) 60.06 deg

18) If the optical density of a medium increases, its refractive index -

1 point

- (a) increases
- (b) decreases
- (c) remains same

Accepted Answers:

(a) increases

19) The time taken by light to travel a distance of 1 km in water (refractive index = 1.333) is - (speed of light in vacuum = 3×10^8 km/sec)

1 point

- (a) 2.222 microseconds
- (b) 4.444 microseconds
- (c) 3.333 microseconds
- (d) 0 microseconds

Accepted Answers:

(b) 4.444 microseconds

20) The correct order of refractive index (RI) for an optical fibre, for optical communication, is -

1 point

- (a) RI of core < RI of cladding
- (b) RI of core > RI of cladding
- (c) RI of core = RI of cladding

Accepted Answers:

(b) RI of core > RI of cladding

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