S&A Class Test 1

1st Class Test of 45 Minutes, No Negative marking and No auto submission. Full Marks: 30

* Required

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The electrons acquire energy and this energy allows the electron to:– Release themselves from the surface of the material by overcoming the _____ of the substance. 1 point

- (●) work function
- ( ) quantum energy
- ( ) thermal energy
- ( ) kinetic energy

Clear selection

A resistive strain gauge, G = 2.2, is cemented on a rectangular steel bar with the elastic modulus E = 205 x 106 kN/m2, width 3.5 cm and thickness 0.55 cm. An axial force of 12kN is applied.Determine the change of the resistance of the strain gauge, ΔR, if the normal resistance of the gauge is R=100 Ω. 2 points

- ○ 0.075 Ω
- ◉ 0.067 Ω
- ○ 0.060 Ω
- ○ 0.05 Ω

Clear selection

The heat generated or absorbed at the junction of two dissimilar materials when an emf exists across the junction due to the current produced by this emf in the junction is known as_____ 1 point

- ○ none of the options
- ○ thompson effect
- ◉ peltier effect
- ○ seeback effect

Clear selection

Give one example each of absolute and relative sensor 2 points

- (●) strain gauge, thermo-couple
- ( ) thermistor, strain gauge,
- ( ) LVDT, thermistor
- ( ) strain gauge, LVDT

Clear selection

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A strain gauge with nominal resistance R = 100 Ω is installed in a branch of a Wheatstone bridge having for unstrained strain gauge R1 = R2 = R3 = R4 = R and Vi = 10 V. As a result of bending the beam, on which it is cemented, the strain gauge is subject to a strain. A digital voltmeter with input resistance R m = 10 MΩ gives a reading of Vo = 5 mV = 5 *10-3 V. Calculate the:a) change of the resistance ΔR, b) the strain ε for gauge factor G = 2 . 3 points

- ( ) 0.2 Ω, 0.002
- ( ) 0.25 Ω, 0.050
- ( ) 0.2 Ω, 0.005
- (●) 0.2 Ω, 0.001

Clear selection

Electrons can collide with other electrons and release them across the bandgap; this is called an_____ 2 points

- (●) avalanche effect
- ( ) quantum effect
- ( ) multiplier effect
- ( ) thermal effect

Clear selection

Smallest change which a sensor can detect is known as _____ 1 point

- ( ) Precision
- ( ) Accuracy
- ( ) Sensitivity
- (●) Resolution

Clear selection

Name *

Bhupendra Chouhan

Range of Infra red is_____ 1 point

- 650 nm
- 750 nm
- 600 nm
- 700 nm

Clear selection

The algebraic sum of the thermo-electric forces in a circuit composed of any number and combination of dissimilar materials is zero if all junctions are at uniform temperatures 1 point

- Law of heterogeneous materials
- Law of intermediate materials
- Law of homogeneous materials
- Law of intermediate temperatures.

Clear selection

Why platinum is preferred for making RTD? Find the wrong option 2 points

- (●) Low sensitivity
- ( ) Noble metal
- ( ) Good linearity
- ( ) High melting point

Clear selection

Roll No. *

2

A platinum resistance thermometer has a resistance of 100 Ω at 0 °C. When measuring the temperature of a heat process a resistance value of 177 Ω is measured using a Wheatstone bridge. Given that the temperature coefficient of resistance of platinum is 0.0035/°C, determine the temperature of the heat process, correct to the nearest degree. 2 points

- ( ) 200
- ( ) 210
- (●) 220
- ( ) 203

Clear selection

SI unit of the luminance _____ 1 point

- Candela
- Candela per square meter
- Lumen
- (●) Candela per meter square

Clear selection

The example each of active sensor and passive sensor are_____and_____. 2 points

- solar cell, piezoelectric
- solar cell, strain gauge
- (●) capacitive, strain gauge
- thermistor, thermo-couple

Clear selection

What do you mean by self-heating effect in RTD? How to reduce the self-heating error of it? 2 points

- (●) Current through RTD, compromising sensitivity.
- Voltage through RTD, decreasing sensitivity.
- Resistance through RTD, decreasing sensitivity.
- Current through RTD, increasing sensitivity.

Clear selection

When sensor is illuminated, its conductivity changes (the conductivity _____and hence the resistance _____) depending on the change in carrier concentrations . 2 points

- ○ decreases, decreases
- ○ increases, increases
- ○ decreases, increases
- ◉ increases, decreases

Clear selection

A photo-diode works based on _____principle with _____bias voltage. 2 points

- ○ photo voltaic, reverse
- ○ avalanche, reverse
- ○ photo conductive, forward
- ◉ photo conductive, reverse

Clear selection

The main advantage of using semiconductor strain gauge. 1 point

- [ ] all the options
- [ ] high sensitivity
- [ ] positive and negative changes
- [x] high gauge factor
- [ ] low hysteresis

Clear selection

A K thermo-couple produces a voltage which is measured by the potentiometer as 25mV. Determine the temperature T when the Reference Junction isothermal block is indicated by a thermistor as 0 °C. Use the Seebeck coefficient for 20 °C using chart of K type thermo-couple.. 2 points

- [ ] 500 °C
- [ ] 400 °C
- [x] 625 °C
- [ ] others
- [ ] 20 °C

Clear selection

Submit