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Question Paper Code: 54055

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Fourth Semester

Electronics and Instrumentation Engineering

15UEI405 - INDUSTRIAL INSTRUMENTATION - I

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Load cells are used for the measurement of
(a) Stress (b) Weight (c) Strain (d) Velocity
- Which of the following is not a speed measuring instrument?
(a) Psychrometer (b) Stroboscope (c) Tachometer (d) all the above
- Mass of wood is 2600 kg and volume is 5.2 m^3 , its density is
(a) 500 kg m^{-3} (b) 50 kg m^{-3} (c) 5000 kg m^{-3} (d) 2×10^{-3}
- A car initially at rest accelerates in a straight line at 3m/s^2 . What will be the speed after 2 seconds?
(a) 0 m/s (b) 5 m/s (c) 6 m/s (d) 3 m/s
- Configuration of Bourdon spring tube is never made of _____ shape.
(a) circular (b) Semi-circular (c) helical (d) spring
- Pressure of 0.0001 absolute psi can be measured by _____ gauge.
(a) McLeod (b) Pirani (c) Thermocouple (d) None of these

7. _____ temperature scale assigns 0° to the 'ice point' and 80° to the 'steam point'.
- (a) Celsius (b) Rankine (c) Reaumur (d) Fahrenheit
8. Thermistors are made of
- (a) Ultra pure metals (b) Metal oxides
(c) Iron-copper alloys (d) Nickel-chromium alloys
9. Which of the following thermocouples can measure the maximum temperature?
- (a) Platinum-rhodium (b) Tungsten-molybdenum
(c) Chromel-alumel (d) Iron-constantan
10. Radiation pyrometers as compared to thermocouples
- (a) has a slower speed of response
(b) can measure higher temperature
(c) can't measure the temperature of moving objects
(d) is more affected by corrosive atmosphere

PART - B (5 x 2 = 10 Marks)

11. Define magneto-elastic effect.
12. Give different modes of Seismic instruments.
13. State the principle of LVDT.
14. Distinguish between RTD and Thermistors.
15. Name the factors that affect the response of Thermocouple.

PART - C (5 x 16 = 80 Marks)

16. (a) Describe the principle and construction of piezo electric load cell . (16)
- Or
- (b) Analyze the working of DC and AC tacho generator with neat sketch and give its merits and demerits. (16)
17. (a) Discuss the seismic transducer and explain its operation in displacement mode and acceleration mode. (16)

Or

- (b) Explain mechanical type vibration measuring instruments with merits and demerits. (16)
18. (a) Summarize the working of hot and cold cathode type ionization gauge. Cold Cathode Type Ionization Gauge. (16)
- Or
- (b) Analyze the principle of working of bellows and diaphragm with neat sketch. (16)
19. (a) Explain the possible sources of errors in filled in system thermometers and give its compensation. (16)
- Or
- (b) Discuss the electrical methods of temperature measurement. Resistive Temperature Detectors (RTD). (16)
20. (a) Analyze the signal conditioning circuit of thermocouple. (16)
- Or
- (b) Explain fiber optic method of temperature measurement. (16)
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