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Question Paper Code: 41061

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2015.

Fourth Semester

Instrumentation and Control Engineering

01UIC402 - INDUSTRIAL INSTRUMENTATION - I

(Common to Electronics and Instrumentation Engineering)

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Point out the range, accuracy and resolution in hydraulic load cell.
2. Write the formula for determining the actual speed in a stroboscope.
3. Define Piezo - electric effect.
4. What is API scale?
5. Mention the formula for calculating the pressure in a Mcleod gauge.
6. What is the function of a dead weight tester?
7. How barometric error can be minimized in filled system thermometer?
8. What is thin Film RTD?
9. Define first law of thermocouple.
10. How the calibration is adjusted in optical pyrometer?

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Explain the working principle of pneumatic load cell. (8)
- (ii) Elucidate the operation of AC tachogenerators with neat sketch. (8)

Or

- (b) (i) With neat diagram, explain the working principle of magneto elastic load cell. (8)
(ii) Explain the torque measurement by relative angular twist method (optical type). (8)
12. (a) (i) Explain the working of variable reluctance type accelerometer with neat diagram. (8)
(ii) With neat diagram, explain the operation of ultrasonic densitometer. (8)

Or

- (b) (i) List the various calibration methods of vibration pickups, explain them in detail. (8)
(ii) Explain the operations of bridge type gas densitometer. (8)
13. (a) (i) With neat diagram, illustrate the operation of capacitive type pressure gauge. (8)
(ii) Explain in detail about the operation of thermal conductivity gauge. (8)

Or

- (b) (i) Illustrate the operation of elastic element with LVDT based pressure measurement. (8)
(ii) Explain in detail about the working of ionization gauges (cold cathode type). (8)
14. (a) (i) Write short notes on primary and secondary fixed points thermometers. (8)
(ii) Explain the working of 3 lead and 4 lead RTDs. (8)

Or

- (b) (i) Explain in detail about the operations of bimetallic thermometer. (8)
(ii) Explain about the signal conditioning methods for industrial RTDs. (8)
15. (a) (i) Illustrate the operation of reference junction compensation of thermocouple in detail. (8)
(ii) Explain the operation of two colour radiation pyrometer. (8)

Or

- (b) (i) List any five advantages and disadvantages of thermocouple. (8)
(ii) Explain the operation of fiber optic temperature measurement. (8)