Reg. No. : | | | | | | | | | | |

Question Paper Code: 50545

B.E. / B.Tech. DEGREE EXAMINATION, MAY 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)

1. In a drag cup type AC tacho generator, the output voltage is

   (a) sinusoidal (b) in the form of pulses
   (c) modulated waveform (d) constant DC because rectifiers are used

2. In DC tacho generators used for measurement of speed of a shaft , frequent calibration has to done because

   (a) the contacts wear off
   (b) strength of permanent magnet decrease with age
   (c) the armature current produces heating effects
   (d) all the above

3. Piezoelectric accelerometers

   (a) should not be used for high frequencies above 10Hz
   (b) should be used for low frequencies
   (c) should use a monitoring source of low input impedance
   (d) have a low natural frequency

4. Which property measures the resistance of a liquid to flow

   (a) density (b) viscosity (c) volume (d) solubility

5. A U-tube differential manometer is used inverted when

(a) pressure difference is small (b) pressure difference is large
(c) cannot be used inverted (d) none of these

6. Signal conditioning is carried out by the capillary tubes which convert gas pressure into a mercury height. This statement pertains to

(a) Bourdon tube pressure gauge (b) Pirani gauge
(c) Mcleod gauge (d) Diaphragm pressure transducer

7. Recording is not possible with

(a) Liquid in glass thermometer (b) Thermocouple
(c) Filled in system thermometer (d) Pyrometer

8. Self compensating capillary tube is used in the filled in system thermometer to eliminate or minimize

(a) elevation effect (b) immersion effect
(c) barometric effect (d) temperature effect

9. Electrical output from a thermocouple circuit is detected by using

(a) Wheatstone bridge (b) Current sensitive bridge
(c) Voltage balancing circuit (d) Amplifier circuit

10. Which arrangement has the manual null balance operation

(a) Optical pyrometer (b) Resistance thermometer
(c) Liquid in glass thermometer (d) Thermocouple

PART - B (5 x 2 = 10 Marks)

11. Define magneto-elastic effect.

12. Define density. Give some units of density.

13. State the principle of Mc leod gauge.

14. Define boiling point, freezing point and triple point.

15. What are the uses of radiation pyrometer?

PART - C (5 x 16 = 80 Marks)

16. (a) Describe the principle and construction of

(i) Stroboscope (8)

(ii) Strain gauge load cell (8)

Or

(b) Explain the construction and working of DC and AC tacho generator with diagram and mention its advantages and disadvantages. (16)

17. (a) Explain in detail about Piezoelectric and variable reluctance accelerometer with neat sketch. Give its merit and demerits. (16)

Or

(b) Describe the working of following gas densitometer with neat sketch

(i) Electromagnetic suspension type (8)

(ii) Thermal conductivity densitometer (8)

18. (a) Explain in detail about electrical methods of pressure measurement with neat diagram. (16)

Or

(b) Describe the vacuum pressure measurement with neat diagram using

(i) Thermal conductivity gauge (8)

(ii) Ionization gauge (8)

19. (a) Explain in detail about different types of filled system thermometers with neat sketch. (16)

Or

(b) Describe the construction and working of following with neat sketch

(i) 4 wires RTDs (8)

(ii) Bimetallic thermometer (8)

20. (a) Write short notes on

(i) Laws of intermediate temperatures and metals (8)

(ii) Cold junction compensation of thermocouple (8)

Or

(b) Explain in detail about

(i) Total radiation pyrometers (8)

(ii) Optical pyrometers (8)

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