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

Question Paper Code: 41642

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Fourth Semester

Instrumentation and Control Engineering

14UIC402 - INDUSTRIAL INSTRUMENTATION - I

(Common to Electronics and Instrumentation Engineering)

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which of the following statements is true about stroboscope?

   (a) Stroboscope is non-contact type frequency instrument
   (b) Stroboscope can measure frequency upto 5 *Hz*
   (c) Stroboscope uses electromagnetic radiations to measure frequency
   (d) All the above

2. Pneumatic load cells use this method for measuring

   (a) temperature (b) pressure
   (c)force (d) torque

3. An LVDT has an output in the form of

   (a) linear displacement of core (b) pulse
   (c) rotary movement of core (d) angular movement of core

4. The atmospheric pressure is taken as one bar: 1bar =

   (a)10.3 kg/cm^2 (b)20.6 kg/cm^2
   (c)5.2 kg/cm^2 (d) 15.8 kg/cm^2

5. 1 *psi* is equal to

(a) 6·895 *pa* (b) 68·95 *pa* (c) 6·895 *k pa* (d) 68·95 *k pa*

6. Pirani gauge is a device that measures _____ pressure.

(a) absolute (b) relative
(c) vacuum (d) low pressure

7. Thermistor can be used to measure

(a) flow (b) level
(c) temperature (d) pressure

8. Resistors with negative temperature co efficient are called as

(a) Thermocouple (b) Thermistor
(c) RTD (d) pyrometer

9. Optical pyrometer is used to measure

(a) light intensity (b) low temperature
(c) high temperature (d) light intensity and high temperature

10. The optical pyrometer cannot be used for temperature under _____ approximately.

(a) 800^{0} c (b) 900^{0} c (c) 1000^{0} c (d) 700^{0} c

PART - B (5 x 2 = 10 Marks)

11. How a drag cup tachometer is used to measure speed.

12. Draw the schematic of a strain gauge accelerometer and mark the various parts in it.

13. Differentiate gauge pressure and absolute pressure.

14. Write the operating principle of a bimetallic thermometer.

15. Give the operating principle of fibre optic temperature measurement.

PART - C (5 x 16 = 80 Marks)

16. (a) What is a load cell? Explain with neat sketches the construction and working of any three types of load cells. (16)

Or

(b) Define torque. Explain how torque is measured using strain gauge? Mention its advantages and disadvantages. (16)

17. (a) What is acceleration? Describe any three types of accelerometers with necessary diagrams. (16)

Or

(b) Describe the operating principle of a pressure head type densitometer for open and closed tanks with relevant diagrams. (16)

18. (a) With a neat sketch derive and explain any two types of manometers. (16)

Or

(b) Discuss any three electrical methods of pressure measurement in detail. (16)

19. (a) Describe the various sources of errors in filled in system thermometers and their compensation. (16)

Or

(b) Explain in detail 3 lead and 4 lead compensation techniques in RTD with necessary diagrams. (16)

20. (a) Illustrate how radiation measurement is done using optical pyrometers. Mention its advantages and disadvantages. (16)

Or

(b) Why cold junction compensation is necessary in thermocouple? Describe any three cold junction compensation techniques in detail. (16)

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