Reg. No. :

Question Paper Code: 44602

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

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. The weight of one kg of mass is expressed as 1kgf =

    (a) 9.8 Newton   (b) 10 Newton
    (c) 9.5 Newton   (d) 9.2 Newton

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. The basic unit of viscosity is the

    (a) gm/cm^3 (b) kgf   (c) poise   (d) kgf/cm^3

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. The resistance of Pt-100 RTD at a temperature of $200°C$ is

    (a) $138·5\ ohms$ (b) $200\ ohms$

    (c) $277\ ohms$ (d) $177\ ohms$

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. Define Stroboscope.

12. What are the applications of bridge type gas densitometer?

13. Differentiate gauge pressure and absolute pressure.

14. Point out the factors governs the sizes of wires used for thermocouples.

15. List the advantages of RTD's.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain about magneto elastic and piezo electric load cell with neat sketch.

                                                     (16)

Or

    (b) Explain any one method of torque measurement with neat diagram.   (16)

17. (a) Explain the working principle of strain gauge accelerometer.   (16)

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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) How are the following transducers used to measure low pressure?

    (i) Thermocouple vacuum gauge

    (ii) Ionization gauge (16)

19. (a) Describe the construction and working of 3 wires and 4 wires RTDs. (16)

Or

(b) Explain in detail about bimetallic thermometer and its types. (16)

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

Or

(b) (i) Explain optical radiation pyrometer. (8)

    (ii) Explain total radiation pyrometer. (8)

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