

F 3212

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

Fifth Semester

Branch : Applied Electronics and Instrumentation Engineering

TRANSDUCERS AND RECORDING SYSTEMS (A)

(Old Scheme—Supplementary/Mercy Chance)

[Prior to 2010 Admissions]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions briefly.

Each question carries 4 marks.

1. What is a transducer ? Give its advantages and classification.
2. Explain the method of calibration of a thermometer.
3. Give the advantages and disadvantages of thermocouples.
4. List four pair of materials used for four standard thermocouple combinations.
5. Explain why inductive transducers are usually iron-cored. Suggest the important considerations to be applied while designing and using them.
6. What are the factors limiting the bandwidth and sensitivity of a LVDT ?
7. What are the precautions to be taken while using metallic wire strain gauges ?
8. Define the term piezo-resistive coefficient and explain why semiconductor strain gauges have high values for the gauge factor.
9. Explain why does the strip chart recorder use a curvilinear chart.
10. What are the primary functions for a galvanometric recorder ?

(10 × 4 = 40 marks)

Part B

Answer all questions.

Each full question carries 12 marks.

11. Explain the theory and construction of Bimetallic thermometers. What are the commonly used metals ? How is the construction of Bimetallic thermometers used for industrial applications different ? What are their advantages, disadvantages, ranges and application ?

Or

12. Explain the construction and working of liquid-in-glass thermometers. Describe the corrections applied in the case of total immersion and partial immersion thermometers.

Turn over

13. (a) Describe the different methods used for reference junction compensation for thermocouples. (6 marks)
- (b) With neat diagram, explain the three-wire circuit method of temperature measurement. (6 marks)

Or

14. (a) Explain the theory of optical pyrometer. Describe the different receiving elements. (7 marks)
- (b) Describe the principle of working of digital thermometer. (5 marks)
15. Describe the constructional features and working of a LVDT and comment on the merits in comparison to a push-pull self inductive transducer. Explain how displacement is measured with the help of LVDT.

Or

16. Show how a capacitive transducer can be used to monitor the thickness of an insulating sheet in motion, without making physical contact. Comment on the linearity and sensitivity of the system.
17. (a) With neat sketches, explain the construction of wire wound strain gauges and derive the expression for the gauge factor. (8 marks)
- (b) Why are resistance strain gauges used in pairs? (4 marks)

Or

18. (a) With neat diagrams, describe the construction of foil type strain gauges and explain their advantages over wire wound strain gauges. (8 marks)
- (b) Distinguish between Bonded and Unbonded strain gauges and comment on their suitability for measurement of physical quantities. (4 marks)
19. Describe the basic components of a magnetic recorder. Explain how the storage and reading operations take place. How FM recording is done?

Or

20. With a neat cross-sectional diagram, describe the construction and working principle of a CRT, explaining the function of each electrode in it. Show how a sine wave is displayed on its screen.

[5 × 12 = 60 marks]