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SEVENTH SEMESTER B.TECH. (ENGINEERING) [09 SCHEME] D EXAMINATION, NOVEMBER 2016

ME/PTME 09 703-METROLOGY AND INSTRUMENTATION

Time : Three Hours

Maximum : 70 Marks

Name.

Reg. No.

Part A

All questions are compulsory. Each question carries 2 marks.

- 1. List four objectives of metrology.
- 2. What are the applications of strain gauges ?
- 3. Define temperature. How is it different from heat?
- 4. What is sine bar? How it is used for angle measurement?
- 5. Define the terms accuracy and precision.

 $(5 \times 2 = 10 \text{ marks})$

Part B

Answer **four** questions out of six. Each question carries 5 marks.

- 6. Distinguish between direct and indirect measurements. Give two examples of each.
- 7. Discuss the sources of errors and precautions in measurement of temperature.
- 8. Enumerate the advantages and disadvantages of thermistors.
- 9. Discuss about the field of use of machine vision systems.
- 10. With a neat sketch write short note on : (i) Straightness ; (ii) Squareness.
- 11. What is gauge factor ? Discuss its importance.

 $(4 \times 5 = 20 \text{ marks})$

Part C

12. (a) What are the various possible sources of errors in measurements ? What do you understand by systematic errors and random errors ? How the random errors are analyzed ?

Or

(b) Explain the need of standards of measurements in the modern industrial system.

Turn over

(Pages : 2)

(6 marks)

13. (a) What is transducer ? Explain in detail about two different types of transducer with a neat sketch. TA COLORN

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Or

- (b) Explain in detail about the construction and working of McLeod gauge.
- 14. (a) With the help of neat sketch, explain the construction and working of a Resistance Temperature Detectors (RTD).

- (4 marks) (b) (i) List four thermocouple used in industry and also mention their range.
 - (ii) With a neat sketch, explain a liquid-in-glass thermometer.

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15. (a) Explain in detail about principle of Parkinson gear tester device with a neat sketch.

Or

(b) Explicate in detail about 3 methods of amplitude and spacing measurements based on which surface roughness parameters are classified.

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 $[4 \times 10 = 40 \text{ marks}]$