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

Question Paper Code : 21857

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Fifth Semester

Mechanical Engineering

ME 2304/ME 54/ME 1304/080120044/10122 ME 505 — ENGINEERING METROLOGY AND MEASUREMENTS

(Common to Production Engineering)

(Regulations 2008/2010)

(Common to PTME 2304/10122 ME 505 — Engineering Metrology and Measurements for B.E. (Part – Time) Fourth Semester — Mechanical Engineering — Regulations 2009/2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define sensitivity and range.

2. What are random errors?

3. What is angle decker?

4. State the principle of interferometry.

5. What are the various methods of measuring pitch diameter?

6. What are the factors affecting surface roughness?

7. Define machine vision.

8. List the various geometrical checks made on machine tools.

9. Give the principle of hot wire anemometer.

10. What is a Kentometer?

PART B — (5 × 16 = 80 marks)

11. (a) Draw the block diagram of generalized measurement system and explain the different stages with examples.

Or

(b) Explain systematic and random errors with examples.

12. (a) With a neat sketch explain the working principle of pneumatic comparator.

Or

(b) (i) What is sine bar? How is it used for angle measurement? (8)

(ii) Explain how sine bar is used to measure angle of a component. (8)

13. (a) Explain the following tooth thickness measurement.

(i) Constant chord method. (8)

(ii) Chordal thickness method. (8)

Or

(b) Explain the following direct Instrument measurements

(i) Stylus probe type instrument. (8)

(ii) Tomlinson surface meter. (8)

14. (a) Explain the construction and working of a laser Telemetric system with a neat sketch.

Or

(b) (i) Mention the advantages and disadvantages of CMM. (8)

(ii) Explain how the performance of CMM is evaluated. (8)

15. (a) (i) With a sketch explain the torque measurement using strain gauges. (8)

(ii) Describe the construction and working of hydraulic dynamometer. (8)

Or

(b) (i) With a neat sketch explain how metallic strips are used for temperature measurements. (8)

(ii) Explain the working principle of electrical resistance thermistors. (8)