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

Question Paper Code : 31570

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Fifth Semester

Mechanical Engineering

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

(Common to Production Engineering)

(Regulation 2008/2010)

(Common to PTME 2304 — Engineering Metrology and Measurements for B.E. (Part-Time) Fourth Semester — Mechanical Engineering — Regulation 2009)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by static response?

2. Define tolerance and zero line.

3. What are the constructional requirements of a good sine bar?

4. What is a comparator?

5. Define Degree of fullness and Degree of emptiness in form factor.

6. Define lead and lead angle.

7. Define machine vision.

8. Define Straightness of axes.

9. What is the function of load cell?

10. Name any four instruments used for measuring temperature.

PART B — (5 × 16 = 80 marks)

11. (a) Give the structure of generalized measurement system and explain in detail. (16)

Or

(b) (i) Enumerate the desirable characteristics of precision measuring instruments. (8)

(ii) Describe the different types of errors in measurement and their causes. (8)

12. (a) Explain the working principle of AC laser interferometer and explain how the straightness is measured? (16)

Or

(b) Explain the following angular measurement methods using rollers.

(i) Measurement of angle by using rollers. (4)

(ii) Checking the angle of taper plug gauge using rollers. (4)

(iii) Measuring of included angle of an interval dovetail. (4)

(iv) Measuring interior angle of a profile gauge. (4)

13. (a) Explain how V-Block and three point probe are used for measurement of roundness. What are the limitations of V-Block? (16)

Or

(b) Explain the following Direct Instrument measurements

(i) Stylus probe type instrument (8)

(ii) Tomlinson surface meter. (8)

14. (a) (i) With a neat sketch explain the dimensional measurement using Scanning Laser Gauge. (12)

(ii) Name the alignment tests performed on milling machine. (4)

Or

(b) Explain the various types of co–ordinate measuring machines with a neat sketch. (16)

15. (a) (i) With a sketch explain the torque measurement using Strain Gauges. (8)

(ii) Describe the construction of a hydraulic dynamometer and explain how it is used for power measurement? (8)

Or

(b) (i) With a neat sketch explain the velocity measurement using Hot wire Anemometer. (8)

(ii) With a neat sketch explain the flow measurement using Pitot Tube. (8)

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