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Reg. No. : .....

Name : .....

Sixth Semester B.Tech. Degree Examination, May 2011

(2008 Scheme)

08-601: METROLOGY AND INSTRUMENTATION (MP)

Time : 3 Hours Max. Marks : 100

Instructions : *i) Answer **all** questions in Part **A**.*

*ii) Answer **any one full** question from **each** Module in Part **B**.*

PART – A

1. Explain the basic elements of measuring system.
2. Distinguish between primary and secondary standards.
3. Differentiate the terms 'accuracy' and 'precision' in metrology, with an example.
4. Give a comparison of mechanical and pneumatic comparators.
5. What is an optical flat ? Where it is used ?
6. Describe a tool maker's microscope.
7. What is 'Centre Line Average' roughness (Ra) ?
8. Describe a method for measuring screw thread.
9. Explain the classification of transducers.
10. What are the causes and types of experimental errors ? **(10×4=40 Marks)**

P.T.O.

PART – B

Module – 1

11. a) Distinguish between line standards and end standards. How are end standards derived from line standards ?

    b) What precautions should be taken while using slip gauges ? Describe briefly the manufacture and fields of application of slip gauges.

12. a) Sketch a bevel protractor and explain its working, show how acute angles can be measured with it.

    b) Differentiate between "Hole basis system" and 'Shaft basis system' of fits.

Module – 2

13. a) Describe the Johansson "Mikrokator". Explain the advantages and disadvantages of mechanical comparator.

    b) Explain with the help of a neat sketch, the construction and working of a Solex pneumatic comparator.

14. a) Explain with the help of a neat diagram the working of an autocollimator ? Explain its principle and applications.

    b) What are the different methods used for the measurement of surface finish ? Explain the working of profilometer.

Module – 3

15. a) Explain the static and dynamic characteristics of measuring instruments. Derive an expression for gauge factor of a resistance strain gauge.

    b) Explain the working of any two kinds of dynamometers, with the help of diagrams.

16. a) With the help of a sketch, explain an accelerometer.

    b) Explain the different sources of errors. How the errors can be minimized ?

(3×20=60 Marks)