2052

Reg. No. : ....

Name : ....

Seventh Semester B.Tech. Degree Examination, April/May 2012
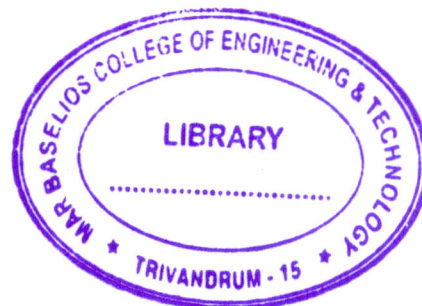### 03-704 : METROLOGY AND INSTRUMENTATION (MN)

Time : 3 Hours

Max. Marks : 100

Instructions : 1) **All** questions in Part – **A** are **compulsory**.
2) **All** questions in Part – **A** carries **4** marks.
3) Answer **one** question from **each** Module in Part – **B**.
4) **Each** question in Part – **B** carries **20** marks.

PART – A

1. What is the relationship between accuracy and cost ?

2. Distinguish between tolerance and allowance ?

3. Explain the term interchangeability.

4. Explain the terms wear allowances and gauge makers tolerance.

5. Sketch the diagram of an auto collimator.

6. How is the surface roughness measured ?

7. What are the necessary conditions for interference of light waves ?

8. What do you mean by scale of readability ?

9. What is an error calibration curve ?

10. Describe the term hysteresis.

(4×10=40 Marks)

P.T.O.

PART – B

Module – I

11. a) Explain the different types of fits.

    b) Explain geometrical tolerances.

12. a) With suitable examples explain line standard and end standard.

    b) Design a general type "GO" and "NOT GO" gauges for component having 25 H_7/f_8 fit being given with usual notations

    i) i (microns) = 0.45 $\sqrt[3]{D}$ +0.001 D (D in mm)

    ii) The upper deviation for f shaft = $-5.5\ D^{0.41}$

    iii) 25 mm falls in the diameter step of 18 and 30. Take wear allowance as 10% of the gauge tolerance.

    Also determine :

    i) Type of fit

    ii) Allowance for the above fit.

Module – II

13. a) Explain the concept of machine vision system.

    b) What are the different methods used for measuring the major elements of gear ?

14. a) What is a CMM ? Explain with the help of neat sketch.

    b) Describe the different terms used in the measurement of surface finish.

Module – III

15. a) Explain the static characteristics of an instrument.

    b) Explain the working principle of pressure and temperature transducers.

16. a) What is a strain gauge ? Explain

    i) Wire wound

    ii) Foil type and

    iii) Semiconductor strain gauges.

    b) Describe the different sources of errors ?

(20×3=60 Marks)