Code No: R05320302 **Set No. 1**

III B.Tech II Semester Regular Examinations, Apr/May 2008
METROLOGY AND SURFACE ENGINEERING
(Mechanical Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. A 35 mm diameter shaft and bearing are to be assembled with a clearance fit. The tolerance and allowances are as under
   Allowances = 0.003 mm
   Tolerance on hole = 0.007 mm
   Tolerance on shaft = 0.002 mm
   Find the limits of size for the hole and shaft if
   (a) Hole basis system is used
   (b) Shaft basis system is used
   The tolerances are disposed of unilaterally. [8+8]
2. Explain and illustrate two simple tests on an optical flat which will reveal whether a surface is convex or concave with a neat sketch. [16]
3. What are the various instruments used for measuring flatness of a surface plate? Describe the test procedure by using one of such instrument. [16]
4. Explain how a pneumatic instrument is used as
   (a) Comparator
   (b) For either internal or external limit gauging. [8+8]
5. (a) State clearly the way in which the micrometer dials used for different thread pitches are graduated.
   (b) Explain how thread micrometer can be used to measure effective diameter of the screw thread. [8+8]
6. State and explain with sketches the various geometrical tests made on lathe machine tool before acceptance. [16]
7. (a) Describe the features of the coordinate measuring machine (CMM)?
   (b) Explicate gear metrology of spur gears with reference to Backlash. [8+8]
8. Explain various chemical cleaning processes in detail. Why sarface cleaning is required. [16]

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