

Code: 9A03603

B.Tech III Year II Semester (R09) Supplementary Examinations May/June 2017

METROLOGY

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 Discuss in detail about how to convert a hole basis system in to an equivalent shaft basis system.
- 2 State and prove Taylor's principles of gauge design. Why are variations from Taylor's principles permitted?
- 3 (a) Explain how the error in parallelism may be obtained using NPL flatness interferometer.
(b) What the various types of optical flats and their features? What is the care that has to be taken in the usage of optical flat?
- 4 (a) Explain the M system and E system of expressing surface roughness.
(b) Discuss about sampling length.
- 5 (a) Indicate briefly the effect of the lead angle on a three wire measurement for an effective diameter of a screw thread.
(b) Using three wires of 2.5 mm diameter over the threads of M60 x 4 mm bolt, a micrometer reading of 61.4012 mm was obtained. Find the pitch error and hence the deviation in the included angle.
- 6 (a) Explain the test of true running of taper socket in main spindle of a lathe machine.
(b) Explain the test of tail stock guide ways with movement of carriage.
- 7 (a) Write briefly on the optical methods of gears inspection.
(b) Describe a method for inspecting the involute profile of a spur gear tooth.
- 8 (a) Explain the roll bonding/cladding process with neat sketches.
(b) Explain weld overlay or unfuse overlays.
