Code: 9A03603

R09

B.Tech III Year II Semester (R09) Supplementary Examinations May/June 2016 METROLOGY

(Mechanical Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions All questions carry equal marks

- 1 (a) What is interchangeability? What are the requirements for implementing interchangeability? What are its advantages?
 - (b) What is selective assembly? What are its benefits?
- 2 Explain with neat sketches how the taper of a blind hole can be measured using two spheres and slip gauges. Deduce expression for dia of larger and small ends of taper.
- 3 Sketch the optical diagram of a Bausch & Lomb Profile Projector and explain the working. How can this projector be used for checking the gear and thread profiles?
- 4 (a) What is a comparator? Classify different types of comparators.
 - (b) How do comparators differ from absolute measuring instruments and limit gauges?
 - (c) What are the requirements of a good comparator design?
- 5 (a) Describe with a sketch, a pitch measuring machine.
 - (b) In measuring the thread angle of standard metric thread, the diameters measured over the wires of 0.8660 and 1.4434 are 20.320 and 22.060 mm respectively.
 - (i) Determine the thread angle.
 - (ii) Find the flank angle.
- 6 (a) Explain the tests to be conducted for installation of lathe machine in vertical and horizontal planes with sketches.
 - (b) Explain the parallelism of tailstock sleeve of a lathe machine to saddle movement.
- 7 (a) Write briefly about the optical methods of gears inspection.
 - (b) Describe a method for inspecting the involute profile of a spur gear tooth.
- 8 (a) Explain thermo chemical diffusion treatments with neat sketches.
 - (b) Explain the thermal spraying. Explain the materials used in thermal spraying. Explain their applications.
