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.

*****