

Code: ME5T4

**III B.Tech - I Semester – Regular/Supplementary Examinations
October 2019**

**ENGINEERING METROLOGY
(MECHANICAL ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11x 2 = 22 M

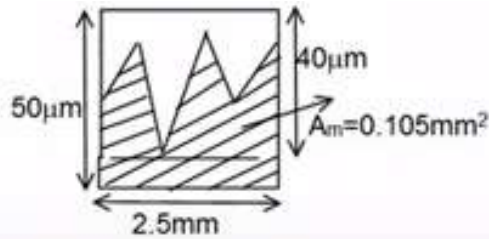
1.

- a) Define basic size, upper and lower limit.
- b) What are types of tolerance systems?
- c) Explain wave length standards.
- d) Explain the method of calibration of slip gauges.
- e) What is limit gauging?
- f) List the uses of optical projectors.
- g) Write working principle of a Autocollimator.
- h) Discuss the working of a Rolling gear tester.
- i) Define thread pitch, and profile thread gauges.
- j) List the uses of comparators.
- k) Write the working principle of mechanical comparator.

PART – B

Answer any **THREE** questions. All questions carry equal marks. 3 x 16 = 48 M

2. a) A fit is specified as 50H7/g6. The tolerance value for a nominal diameter of 50mm Hole in IT7 is 25 microns and IT6 is 16 microns and fundamental deviation for the shaft is -9microns. Find the maximum clearance of the fit in microns. 8 M
- b) Differentiate between interchangeable assembly and selective assembly, with suitable examples. 8 M
3. a) Discuss with suitable sketch, the method of testing straightness by using spirit level. 8 M
- b) A sine bar has a length of 250mm. Each roller has a diameter of 20mm. During taper angle measurement of a component, the height from the surface plate to the centre of a roller is 100mm. Find the taper angle. 8 M
4. a) Describe with a neat sketch the construction, principle and operation of Talysurf. 10 M
- b) During measurement of surface finish, a sampling length of 2.5mm is taken, profile obtained with a magnification of 1000, shown below. Find the form factor. 6 M



5. a) With a neat sketch illustrate how the effective diameter of a screw thread may be checked using the three wire method. 10 M
- b) Describe the pitch measurement of internal screw threads by various methods. 6 M
6. a) Explain the principle of pneumatic comparator and their uses. 6 M
- b) Explain with suitable sketches of any four alignment tests that are to be performed on Milling machine. 10 M