

Code No: 55016

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November - 2015****METROLOGY AND SURFACE ENGINEERING****(Mechanical Engineering)****Time: 3 hours****Max. Marks: 75****Answer any five questions
All questions carry equal marks**

- 1.a) A hole and shaft pair has a basic of size 25 mm and are to have a clearance fit with maximum clearance of 0.02mm and a minimum clearance of 0.01 mm. The hole tolerance is to be 1.5 times the shaft tolerance. Determine limits for both hole and shaft (i) using a hole basis system (ii) using a shaft basis system.
- b) What are the advantages of interchangeable assembly? [8+7]
- 2.a) What is a Sine bar? Explain how it can be used to set a component to a given angle.
- b) Explain the construction and working of a bevel protractor. [8+7]
3. Explain the working principle of tool maker's microscope. What are the uses and specific applications of tool maker's microscope? Explain. [15]
- 4.a) Describe various methods of numerical assessment of surface finish.
- b) The heights of peak and valleys of 20 Successive points on a surface are 35, 25, 40, 22, 37, 19, 41, 21, 42, 18, 42, 24, 44, 25, 40, 18, 40, 18, 39, 21 microns respectively, measured over a length of 20mm. Determine CLA and RMS values of roughness surface. [8+7]
- 5.a) What are the uses and advantages common to all comparator?
- b) Explain the system of displacement and amplification used in mechanical comparator. [7+8]
- 6.a) Describe an experiment to determine the pitch error of a lead screw.
- b) Describe with neat sketch two wire method of measuring the effective diameter of a screw thread. [7+8]
- 7.a) With the help of a line diagram explain the practical method of measurement of wear of surfaces.
- b) Suggest and explain methods to control corrosion of surfaces. [8+7]
8. Using suitable diagrams explain the use of thermal spraying for treatment of surfaces. Comment about the quality of surface obtained. [15]

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