

R09

Code No: 55016

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, March - 2017

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 35mm and are to have a clearance fit with maximum clearance of 0.04mm and a minimum clearance of 0.01mm. The hole tolerance is to be 1.2 times the shaft tolerance. Determine limits for both hole and shaft
i) using a hole basis system ii) using a shaft basis system. [5+5]
- b) What are the advantages of interchangeable assembly? [5+5]
- 2.a) What is a Sine bar? Explain how it can be used to set a component to a given angle.
- b) Explain the different methods of getting magnification in dial indicators. [5+5]
- 3.a) Suggest and explain a method for testing the straightness.
- b) What are the uses and specific applications of tool maker's microscope? Explain. [5+5]
- 4.a) The heights of peak and valleys of 18 Successive points on a surface are 30, 25, 46, 37, 19, 41, 21, 40, 18, 42, 24, 40, 25, 40, 40, 18, 37, 21 microns respectively, measured over a length of 20mm. Determine CLA and RMS values of roughness surface.
- b) Explain an instrument used to measure the surface roughness. [5+5]
- 5.a) Explain the construction and working of sigma comparator.
- b) List out various characteristics of a comparator. [5+5]
- 6.a) Explain how a thread micrometer can be used to measure effective diameter of a thread. What are the advantages and limitations?
- b) Explain how major diameter of internal thread can be measured? [5+5]
- 7.a) Explain the basic characteristics of surfaces.
- b) Explain the use of laser for surface modification. [5+5]
- 8.a) What are coating methods? Explain them in detailed.
- b) What are the applications and advantages of electroforming? [5+5]

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