Code No: 55016 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, February/March - 2016

METROLOGY AND SURFACE ENGINEERING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any five questions

All questions carry equal marks

1.a) Determine and sketch the limits of tolerance and allowance for a 90 mm shaft and hole pair designated H8-e9. The basic size lies in the diameter step of 80 – 100 mm. IT8 = 25i and IT9 = 40i. The fundamental deviation for 'e' shaft is $-11D^{0.41}$ microns.

b) What are dimensional tolerances? Why is their control important? [8+7]

2.a) Taking an example, Explain the concept of limit gauging. What are its advantages and disadvantages?

b) What are angle gauges? Discuss their use in Metrology lab. [8+7]

3.a) Suggest and explain a method for testing the straightness.

b) Describe a method to find out the flatness of surface plate. [7+8]

4.a) Sketch and explain Taylor-Hobson talysurf surface roughness measuring instrument.

b) The heights of peak and valleys of 22 Successive points on a surface are 32, 28, 41, 24, 35, 19, 31, 21, 40, 18, 44, 24, 41, 25, 40, 26,35,18, 40, 18, 39, 21 microns respectively, measured over a length of 20mm. Determine CLA and RMS values of roughness surface. [8+7]

5.a) Explain the construction and working of sigma comparator.

b) List out various characteristics of a comparator. [8+7]

6.a) Discuss 3 wire method of measuring effective diameter of a screw thread. Derive the expression used.

b) Explain how effective diameter of an internal thread can be measured. [8+7]

7.a) Explain the characteristics required for a lubricant.

b) Describe the use of laser for modification of surface. [7+8]

8.a) Explain any one mechanical method of surface treatment.

b) Explain the steps involved in vapor deposition. [8+7]

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