

2010 ME6303 ADVANCED METROLOGY AND COMPUTER AIDED INSPECTION TEST II

Max. Marks: 20

Time: 60 minutes

(All questions carry two marks each, unless otherwise mentioned)

1. The regression equation for the data given below is $100.6 + 0.668571 x$. Compute a 90% uncertainty interval for the slope.

x	10	20	30	40	50	60
y	106	115	121	128	134	140

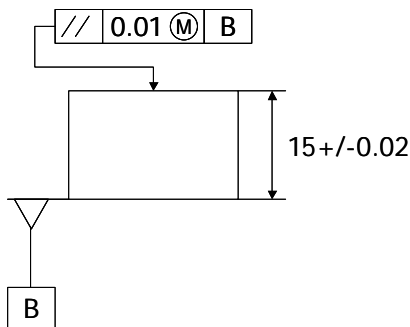
(4 marks)

2. Explain the different datums used for surface profile measurement.
3. Differentiate between sampling length and evaluation length.
4. Explain how the Autocorrelation function can be used to differentiate between a turned and ground surface.
5. The deviations of a shaft from an ideal circle, measured at various angles, are given below. Determine the centre and radius of the best fit Least Squares Circle and calculate the circularity error.

θ (degrees)	0	30	60	90	120	150	180	210	240	270	300	330
r (μm)	2	5	8	0	4	2	0	1	7	4	3	1

(4 marks)

6. For a component made as per drawing below, the parallelism error was found to be 0.02 mm, with the thickness 14.99 mm. Is the component acceptable? Explain why or why not.



7. Sketch the symbol for cylindricity tolerance. Explain how it is defined.
8. Compare the accuracy of a moving bridge CMM with a fixed bridge CMM, giving reasons.
9. What are the functions of software in a CMM?
10. Explain the effect of circularity error on sampling strategy while measuring a hole.