

2013 ME3104 Metrology And Computer Aided Inspection – Test 1

Max. Marks: 20

Approved tables are permitted

Time: 60 minutes

All questions carry 2 marks each unless otherwise mentioned. Approved tables will be provided.

1. Define and explain the terms "Random Measurement error" and "Discrimination threshold" according to VIM 2008.
2. Identify the components of a measurement system for a galvanometer.
3. What are the two major proposals for the redefinition of the kilogram?
4. List and explain the various stages in an experimental test plan as recommended by Montgomery.
5. Explain the problem with correlated factors in experiments.
6. Determine the elastic compression if a brass cylinder of diameter 20 mm is placed between steel anvils of 4 mm dia and a force of 3.5 N applied. Formula sheet will be provided.
7. Explain the common sources of uncertainty in mass calibrations.
8. The number of revolutions of a bicycle wheel to cover the distance between two points A and B was measured several times and the readings were 24.4, 24.7, 25.2, 26.2, 24.9, 25.2, and 25.7. The diameter of the wheel of was measured as 0.45 m using a scale with a least count of 0.01 m and repeated measurement did not show any variation. Determine the 99% expanded uncertainty in the distance between A and B.
(2+2+2 = 6 marks)