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Total Number of Pages : 01

M.Tech  
PDPE203

2<sup>nd</sup> Semester Back Examination 2018-19

METROLOGY

BRANCH : PRODUCTION ENGG

Time : 3 Hours

Max Marks : 70

Q.CODE : F441

**Answer Question No.1 which is compulsory and any FIVE from the rest.  
The figures in the right hand margin indicate marks.**

- Q1 Answer the following questions : (2 x 10)**
- a) Distinguish between allowance and tolerance.
  - b) What is the relationship between sensitivity and range?
  - c) What is wringing of gauge blocks?
  - d) What is a comparator?
  - e) How Taylor's principle is applied to screw thread gauge?
  - f) What are the various methods used for measuring the gear tooth thickness?
  - g) What is secondary texture of a surface?
  - h) What are the benefits of using CMM?
  - i) Define straightness and flatness in surface measurement.
  - j) What is the use of Autocollimator in mechanical measurements?
- Q2 a) Explain the classification of various measuring methods and measuring instruments. (5)**
- b) How sine bars are used for angle measurement? Why is sine bar not suitable for measuring angles above 45°? (5)**
- Q3 a) Explain the working principle of Opto-mechanical comparator with a neat sketch. (5)**
- b) Describe a method of determining an absolute length of slip gauges using interferometer. (5)**
- Q4 a) Describe any one method of measurement the gear tooth thickness. (5)**
- b) Explain a method used in the measurement of surface finish and flatness. (5)**
- Q5 a) Write a short note on automatic measuring machines and applications. (5)**
- b) Examine the importance of CMM in measurement of 3D models. (5)**
- Q6 What is auto collimator? Explain with the help of neat sketches, the principle and construction of an autocollimator. (10)**
- Q7 Determine the dimensions of hole and shaft for a fit 30H7 h8. (10)**  
30mm lies between 18 mm and 30 mm.  
IT7 = 16i, IT8 = 25i. What is the fit?
- Q8 Write short answer on any TWO : (5 x 2)**
- a) limit gauging
  - b) gear inspection
  - c) circularity and roundness
  - d) automatic gauging