

[Total No. of Questions - 8] [Total No. of Printed Pages - 2]
(2123)

1611

M. Tech 3rd Semester Examination

Metrology & Industrial Inspection

PE-E21

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Candidates are required to attempt five questions out of eight questions. Each question carries equal marks.

1. (a) Explain the following term with neat sketches.
 - (i) Imperial standard yard
 - (ii) International prototype meter **(6×2=12)**
- (b) Explain the purpose of calibrating the instrument and discuss the primary and secondary calibration. **(8)**
2. (a) Explain with a neat diagram the measurement of straightness using autocollimators. **(10)**
- (b) Define fits. Describe the various types of fits with suitable example and sketch. **(10)**
3. Explain the principle, general construction and observation of stylus type surface texture measuring instruments. What are the disadvantages of these types of instruments? Why are they widely used? **(20)**
4. (a) Explain the following terms used in surface finish measurement.
 - (i) Roughness

1611/60

[P.T.O.]

- (ii) Waviness
 - (iii) Sampling length
 - (iv) Centre line of profile
 - (v) Lay
 - (vi) Primary texture **(6×2=12)**
- (b) It is not possible to produce perfectly smooth surface. Justify the statement. **(8)**
5. (a) Explain the principle of measurement by light wave interference method. For what type of surfaces interferometric measurements are possible? **(10)**
- (b) By using optical flat and monochromatic light explain the procedure to determine whether the given surface is flat or curved? **(10)**
6. Write short notes on:
- (i) Optical flat (ii) Gauge length interferometer (iii) NPL flatness interferometer (iv) Electrical comparators (v) Pneumatic comparators **(5×4=20)**
7. (a) Name and discuss the various elements of the spur gear which are checked for accuracy of the gear. Also explain the constant chord method. **(15)**
- (b) State the various sources of errors in manufacturing gears. **(5)**
8. (a) Explain the importance of thread micrometer and how screw thread is measured by using one wire, two wire and three wire method. **(15)**
- (b) Define quality and its various characteristics. **(5)**