

III B. Tech I Semester Supplementary Examinations, May - 2018

METROLOGY

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

PART -A

- 1 a) What do you understand by fits? [3M]
 b) Mention few applications of bevel protractors. [4M]
 c) What do you mean by interferometers? [4M]
 d) How is Ten-point average of surface roughness calculated? [3M]
 e) What do you mean by error in screw threads? [4M]
 f) What is purpose of performing alignment test on machine tool? [4M]

PART -B

- 2 a) Bring out the salient features of British standard and ISO systems of limits and fits. [6M]
 b) A 50 mm diameter shaft and bearing are to be assembled with a clearance fit. The [10M]
 tolerance and allowance are as under.
 Allowance = 0.035 mm
 Tolerance on hole = 0.025 m
 Tolerance of shaft = 0.017 mm
 Find the limits of size for the hole and shaft if
 i) Hole basis system is used ii) Shaft basis system is used
- 3 a) Explain with neat sketches the variants of sine bars and their applications. [8M]
 b) Write detailed notes on progressive and positional limit gauges. [8M]
- 4 a) Explain flatness interferometer with neat sketch and write its applications. [8M]
 b) Explain how flatness errors of lapped surfaces are measured with an optical flat. [8M]
- 5 a) Explain following methods of specifying roughness value: [8M]
 i) Peak-to-valley height method ii) Centre-line-average method
 iii) Root mean square method
 b) Explain pneumatic comparator and state the advantages and disadvantages. [8M]
- 6 a) Explain with neat sketches how the gear tooth vernier caliper is used for checking [8M]
 the chordal thickness of a gear tooth.
 b) What is best size wire for effective diameter measurement? Derive a relationship [8M]
 for the best size wire in terms of its effective diameter?
- 7 a) Explain the procedure for checking the straightness of a component using [8M]
 autocollimator.
 b) Explain the parallelism of tailstock sleeve of a lathe machine to saddle movement. [8M]

