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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Third Semester, B.E. – Industrial and Production Engineering

Semester End Examination; Dec - 2016/Jan - 2017

Engineering Metrology

Time: 3 hrs

Max. Marks: 100

Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.

UNIT - I

- 1 a. Explain the following :
- | | | |
|--------------------|-------------------|----|
| i) Accuracy | ii) Precision | 10 |
| iii) Line standard | iv) End standard. | |
- b. Describe with a neat sketch the imperial standard yard. 10
- 2 a. Enumerate the importance of tolerances. 5
- b. With an example, distinguish between unilateral and bilateral tolerances. 5
- c. With a neat sketch, explain hole basis and shaft basis system. 10

UNIT - II

- 3 a. Discuss the Taylor's principle for the design of GO and No-Go gauge. 10
- b. Discuss the various types of gauges. 10
- 4 a. Define the term straightness and flatness. Also mention symbol used. 4
- b. Draw a neat sketch of Sine bar and explain the principle of its working. 6
- c. Construct the sine centre and explain the working principle of it. 10

UNIT - III

- 5 a. Enumerate the need for a comparator. Also mention the applications of comparators. 10
- b. Explain the working of Pneumatic Solex comparator with the help of a neat sketch. 10
- 6 a. Sketch and explain the working of the laser interferometer. 10
- b. Draw a neat sketch of Autocollimator and also explain the principle of working of it. 10

UNIT - IV

- 7 a. Explain with a neat sketch Tomlinson's surface meter. 14
- b. Define the following :
- | | |
|--------------------------|---|
| i) Surface Roughness | 6 |
| ii) Primary Textures | |
| iii) Secondary Textures. | |
- 8 a. Draw a neat sketch of screw thread and explain the various terminologies. 8
- b. Explain the best size wire method. 6
- c. Distinguish between two and three wires method. 6

UNIT - V

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|-------|--|----|
| 9 a. | Enumerate the various alignment tests on Lathe. Explain any one. | 10 |
| b. | Enumerate the various alignment tests on Milling machine. Explain any one. | 10 |
| 10 a. | Distinguish between Destructive and Non-Destructive testing methods. | 5 |
| b. | Enumerate the various Non-Destructive testing methods. | 5 |
| c. | Explain the following with a neat sketch : | |
| i) | Magnetic Particle inspection | 10 |
| ii) | Ultrasonic Testing. | |

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