



## 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**

- |       |                                                                            |    |
|-------|----------------------------------------------------------------------------|----|
| 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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