Code No: R05320302 **R05** **Set No. 2**

III B.Tech II Semester Examinations,December 2010
METROLOGY AND SURFACE ENGINEERING
Mechanical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Name and explain the various instruments required for performing the alignment tests on machine tools. [16]
2. Discuss various thermal coating processes in detail with help of neat sketches. [16]
3. Discuss various types of errors that are possible to occur while measuring various elements of screw threads. What are its causes, effects and remedies? Show these in the form of a fish-bone diagram. [16]
4. (a) What is a Collimator? Explain the principle of Collimator? Explain its working.
   (b) Distinguish between Collimator and Autocollimator with their applications. [10+6]
5. Four end bars A, B, C, and D are to be calibrated using a calibrated length bar of 400 mm whose actual length is 399.9998 mm.The bar B is longer than bar A by 0.0004 mm, bar C is longer than bar A by 0.0003 mm, while bar D is shorter than bar A by -0.0001 mm.The four gauges together have a combination length of 400.0002 mm. Determine the connected actual length of each end bar. [16]
6. Explain how a pneumatic instrument is used as
   (a) Comparator
   (b) For either internal or external limit gauging. [8+8]
7. Explain the following methods of tooth thickness measurement
   (a) Chordal thickness method
   (b) Measurement over pins and balls. [8+8]
8. (a) Describe the method of checking the angle of a taper plug gauge using rollers, micrometers and slip gauges.
   (b) Calculate the angle of a taper and minimum diameter of an internal taper from the following readings

Diameter of bigger ball	=	10.25 mm
Diameter of smaller ball	=	6.07 mm
Height of top of bigger ball from datum	=	30.13 mm
Height of top of smaller ball from datum	=	10.08 mm. [8+8]

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Code No: R05320302 **R05** **Set No. 4**

III B.Tech II Semester Examinations,December 2010
METROLOGY AND SURFACE ENGINEERING
Mechanical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What is a Collimator? Explain the principle of Collimator? Explain its working.
   (b) Distinguish between Collimator and Autocollimator with their applications. [10+6]

2. Four end bars A, B, C, and D are to be calibrated using a calibrated length bar of 400 mm whose actual length is 399.9998 mm.The bar B is longer than bar A by 0.0004 mm, bar C is longer than bar A by 0.0003 mm, while bar D is shorter than bar A by -0.0001 mm.The four gauges together have a combination length of 400.0002 mm. Determine the connected actual length of each end bar. [16]

3. (a) Describe the method of checking the angle of a taper plug gauge using rollers, micrometers and slip gauges.
   (b) Calculate the angle of a taper and minimum diameter of an internal taper from the following readings

Diameter of bigger ball	=	10.25 mm
Diameter of smaller ball	=	6.07 mm
Height of top of bigger ball from datum	=	30.13 mm
Height of top of smaller ball from datum	=	10.08 mm. [8+8]

4. Explain how a pneumatic instrument is used as
   (a) Comparator
   (b) For either internal or external limit gauging. [8+8]

5. Name and explain the various instruments required for performing the alignment tests on machine tools. [16]

6. Discuss various thermal coating processes in detail with help of neat sketches. [16]

7. Discuss various types of errors that are possible to occur while measuring various elements of screw threads. What are its causes, effects and remedies? Show these in the form of a fish-bone diagram. [16]

8. Explain the following methods of tooth thickness measurement
   (a) Chordal thickness method
   (b) Measurement over pins and balls. [8+8]

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Code No: R05320302 **R05** **Set No. 1**

III B.Tech II Semester Examinations,December 2010
METROLOGY AND SURFACE ENGINEERING
Mechanical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Discuss various types of errors that are possible to occur while measuring various elements of screw threads. What are its causes, effects and remedies? Show these in the form of a fish-bone diagram. [16]
2. Name and explain the various instruments required for performing the alignment tests on machine tools. [16]
3. (a) What is a Collimator? Explain the principle of Collimator? Explain its working.
   (b) Distinguish between Collimator and Autocollimator with their applications. [10+6]
4. (a) Describe the method of checking the angle of a taper plug gauge using rollers, micrometers and slip gauges.
   (b) Calculate the angle of a taper and minimum diameter of an internal taper from the following readings

Diameter of bigger ball	=	10.25 mm
Diameter of smaller ball	=	6.07 mm
Height of top of bigger ball from datum	=	30.13 mm
Height of top of smaller ball from datum	=	10.08 mm.

   [8+8]
5. Explain the following methods of tooth thickness measurement
   (a) Chordal thickness method
   (b) Measurement over pins and balls. [8+8]
6. Four end bars A, B, C, and D are to be calibrated using a calibrated length bar of 400 mm whose actual length is 399.9998 mm.The bar B is longer than bar A by 0.0004 mm, bar C is longer than bar A by 0.0003 mm, while bar D is shorter than bar A by -0.0001 mm.The four gauges together have a combination length of 400.0002 mm. Determine the connected actual length of each end bar. [16]
7. Discuss various thermal coating processes in detail with help of neat sketches. [16]
8. Explain how a pneumatic instrument is used as
   (a) Comparator
   (b) For either internal or external limit gauging. [8+8]

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Code No: R05320302 **R05** **Set No. 3**

III B.Tech II Semester Examinations,December 2010
METROLOGY AND SURFACE ENGINEERING
Mechanical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Describe the method of checking the angle of a taper plug gauge using rollers, micrometers and slip gauges.
   (b) Calculate the angle of a taper and minimum diameter of an internal taper from the following readings

Diameter of bigger ball	=	10.25 mm
Diameter of smaller ball	=	6.07 mm
Height of top of bigger ball from datum	=	30.13 mm
Height of top of smaller ball from datum	=	10.08 mm.

[8+8]

2. Four end bars A, B, C, and D are to be calibrated using a calibrated length bar of 400 mm whose actual length is 399.9998 mm.The bar B is longer than bar A by 0.0004 mm, bar C is longer than bar A by 0.0003 mm, while bar D is shorter than bar A by -0.0001 mm.The four gauges together have a combination length of 400.0002 mm. Determine the connected actual length of each end bar. [16]

3. Explain how a pneumatic instrument is used as
   (a) Comparator
   (b) For either internal or external limit gauging. [8+8]

4. Discuss various thermal coating processes in detail with help of neat sketches. [16]

5. Name and explain the various instruments required for performing the alignment tests on machine tools. [16]

6. (a) What is a Collimator? Explain the principle of Collimator? Explain its working.
   (b) Distinguish between Collimator and Autocollimator with their applications. [10+6]

7. Discuss various types of errors that are possible to occur while measuring various elements of screw threads. What are its causes, effects and remedies? Show these in the form of a fish-bone diagram. [16]

8. Explain the following methods of tooth thickness measurement
   (a) Chordal thickness method
   (b) Measurement over pins and balls. [8+8]

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