Code :R7320303 1

III B.Tech II Semester(R07) Regular & Supplementary Examinations, April/May 2011
METROLOGY & 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) Differentiate between: tolerance and allowance: selective assembly and interchangeability: clearance fit and interference fits.
   (b) Identify the following fits.
   $30H_8K_6$
   $40H_7S_7$
   $60H_6d_8$
2. (a) Enumerate various types of micrometers.
   (b) Describe measurement of angles using gauges.
3. (a) Explain the working principle of interferometer.
   (b) Explain flatness measurement using straight edges.
4. (a) Define terms: RMS value and arithmetic average.
   (b) Describe working principle of sigma comparator.
5. What are the various methods measuring effective diameter? Illustrate.
6. Enumerate alignment tests on a milling machine. Explain any two of them.
7. Describe gear tooth measurement using gear tooth Vernier calipers.
8. Write short notes on:
   (a) Overlay coatings.
   (b) Coordinate measuring machines.

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Code :R7320303 2

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(Mechanical Engineering)

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

Answer any FIVE questions
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1. (a) Explain terms: Allowance, tolerance, interference , fit limits, nominal size.
   (b) Identify the following fits.
   $35H_6K_7$
   $45H_8e_6$
   $50H_7S_8$
2. (a) Differentiate between terms. Gauge vs measuring instrument line vs end standard.
   (b) Describe the measurement of angles using sine bar.
3. (a) Describe the working principle of tool makers microscope.
   (b) Explain flatness measurement using optical flats.
4. (a) Define terms: centre line average arithmetic average.
   (b) Describe working principle of mechanical optical comparator.
5. Discuss various methods of screw pitch measurement.
6. Enlist various alignment tests on a drilling machine explain any two of them.
7. Describe the measurement of pressure angle of gear teeth.
8. Write short notes on:
   (a) Diffusion coatings.
   (b) Applications of CMM.

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Code :R7320303 **3**

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METROLOGY & 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) Differentiate between tolerance and allowance: transition fit and interference fit: BIS system and British system of fits.
   (b) Indenting the following fits
   $40H_6g_8$
   $30H_8P_6$
   $60H_7d_7$
2. (a) Enumerate various gauges for measurement of angles.
   (b) Classify various plug and ring gauges.
3. (a) Describe working principles of autocollimator.
   (b) Explain flatness measurement using optical flats.
4. (a) Define Ra and Rz values.
   (b) Describe working principle optical comparator.
5. Discuss various errors in screw thread measurement illustrate. What are profile thread gauges.
6. What are the various requirements of machine tool alignment tests? Enlist a few tests on a lathe.
7. Discuss the methods of measuring gear tooth thickness.
8. Write short notes on:
   (a) Overlay coatings.
   (b) Applications of CMM.

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Code :R7320303 4

III B.Tech II Semester(R07) Regular & Supplementary Examinations, April/May 2011
METROLOGY & 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) Explain terms: unilateral and bilateral tolerances: shaft based and hole based tolerances: interchangeability and selective assembly
   (b) Identify the following fits.
   $60H_8g_7$
   $50H_7S_8$
   $40H_6h_6$
2. (a) Enumerate differences between line standard and end standards.
   (b) Explain taylor's principles of gauge design.
3. (a) Describe the working principle of optical flats.
   (b) Explain flatness measurement using autocollimator.
4. (a) Differentiate between surface roughness and waviness.
   (b) Describe working principles of electrical comparator.
5. (a) What are various screw thread errors?
   (b) How thread angles are measured?
6. What are various alignment tests on a lathe? Enlist them. Explain tests for centers allignment and parallelism of tool and work.
7. Describe methods of measuring gear tooth thickness.
8. Write short notes on:
   (a) Diffusion coatings.
   (b) Types of CMM.

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