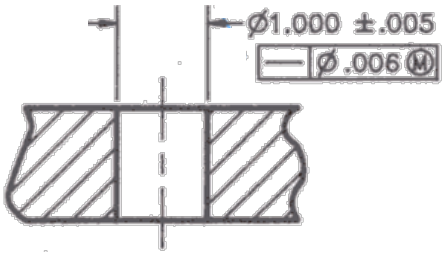
IE-352
Section 1, CRN: 48700/1/2
Section 2, CRN: 48703/4/5
Section 3, CRN: 48706/7/8
Second Semester 1434-35 H (Spring-2014) – 4(4,1,2)
"MANUFACTURING PROCESSES – 2"

Tuesday, April 01, 2014 (01/06/1435H)

Quiz 4

Name:	Student Number: 4	Section: S/M8/M10

Examine the drawing below and answer the following questions. [units: in],



1. **What type of geometric tolerance is involved here (form, orientation, or location)?** [*1 Point*] **ANSWER:** ____

2. ***Describe* below each element of the *feature control frame*.** [*3 Points*]

3. **What is the basic size?** [*1 Point*] **ANSWER:** ____

4. **What is the size of the *virtual shaft*?** [*2 Points*] **ANSWER:** ____

5. **What is the $shaft_{MMC}$ given that an *allowance* of 7 $thousands$ is required?** [*1 Point*]

ANSWER: ____

6. **What is the geometric tolerance for cross sections in the hole having the following sizes?** [*2 Points*]

a. 1.007 **ANSWER:** ____

b. 1.004 **ANSWER:** ____

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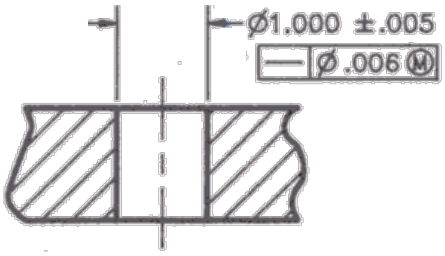
Tuesday, April 01, 2014 (01/06/1435H)

Quiz 4 ANSWERS

Name:	Student Number:	Section:
AHMED M. EL-SHERBEENY, PHD	4	S/M8/M10

Examine the drawing below and answer the following questions. [units: in],



1. **What type of geometric tolerance is involved here (form, orientation, or location)?** [*1 Point*] **ANSWER:** form

2. ***Describe* below each element of the *feature control frame*.** [*3 Points*]

- —: geometric – form – **straightness** tolerance
- Ø .006 Ⓜ: allowable geometric tolerance is a $\mathbf{0.006\ in}$ **cylindrical (internal) error zone** around the center line, and is taken at the $\boldsymbol{MMC}$ **of the hole**
- Note how **no datums** are specified since all form tolerances are specified for individual features

3. **What is the basic size?** [*1 Point*] **ANSWER:** $\mathbf{1.000\ in}$

4. **What is the size of the *virtual shaft*?** [*2 Points*] **ANSWER:** $\mathbf{0.989\ in}$

$$virtual\ shaft: V_c = \phi_{hole@MMC} - GT_{MMC}$$

$$\phi_{hole@MMC} = 1.000 - 0.005 = 0.995\ in$$

$$\phi_{hole@LMC} = 1.000 + 0.005 = 1.005\ in$$

$$GT_{MMC} = 0.006$$

$\Rightarrow V_c = 0.995 - 0.006 = 0.989\ in$

5. **What is the $shaft_{MMC}$ given that an *allowance* of 7 $thousands$ is required?** [*1 Point*]

ANSWER: **$0.596\ in$**

$\phi_{shaft@MMC} = V_c - allowance = 0.989 - 0.007 = 0.982\ in$

6. **What is the geometric tolerance for cross sections in the hole having the following sizes?** [*2 Points*]

a. 1.007 **ANSWER:** **part rejected**

b. 1.004 **ANSWER:** **$0.015\ in$**

a) $size = 1.007$

- Check size: $1.007 > 1.005\ (LMC)$ ($\Rightarrow$ **part is rejected**)

b) $size = 1.004$

- Check size: $0.995 < 1.004 < 1.005$ ($\Rightarrow$ ok)
- $GT_{1.004} = size - V_c = 1.004 - 0.989 = \mathbf{0.015}$