IE-352
Section 1, CRN: 48700/1/2
Section 2, CRN: 48706/7/8
Second Semester 1435-36 H (Spring-2015) – 4(4,1,2)
"MANUFACTURING PROCESSES – 2"

Thursday, March 05, 2015 (14/05/1436H)

Quiz 3 ANSWERS

Name:	Student Number:	Section:
AHMED M. EL-SHERBEENY, PHD	4	10 / 11

Given the following information for a shaft-hole system,

$$Nominal\ Size = \frac{11}{16}"$$

$$LT5\ fit$$

Nominal Size Range, Inches Over	To	Class LT 5 Fit[a]	Std. Tolerance Limits Hole H7	Shaft n6
0 –	0.12	–0.5 +0.15	+0.4 0	+0.5 +0.25
0.12 –	0.24	–0.6 +0.2	+0.5 0	+0.6 +0.3
0.24 –	0.40	–0.8 +0.2	+0.6 0	+0.8 +0.4
0.40 –	0.71	–0.9 +0.2	+0.7 0	+0.9 +0.5
0.71 –	1.19	–1.1 +0.2	+0.8 0	+1.1 +0.6
1.19 –	1.97	–1.3 +0.3	+1.0 0	+1.3 +0.7
1.97 –	3.15	–1.5 +0.4	+1.2 0	+1.5 +0.8

1. **What is the basic size?** [1 Point] **ANSWER:** **0.6875"**

$BS = \frac{11}{16}" = 0.6875\ in$ (note, answer must be expressed to **4 d.p.**)

2. **What is the shaft MMC?** [1 Point] **ANSWER:** **0.6884**

$MMC = BS + (+0.0009) = 0.6875 + 0.0009 = 0.6884$

3. **What is the hole MMC?** [1 Point] **ANSWER:** **0.6875**

$MMC = BS\ (since\ basic\ hole\ system) = 0.6875$

4. **What is the shaft LMC?** [1 Point] **ANSWER:** **0.6880**

$$LMC = BS + (+0.0005) = 0.6875 + 0.0005 = 0.6880$$

5. **What is the hole LMC?** [1 Point] **ANSWER:** **0.6882**

$$LMC = BS + (+0.0007) = 0.6875 + 0.0007 = 2.3762$$

6. **Express the hole and shaft sizes below in the specified formats** [$\frac{1}{2}$ pt. each]

	Hole Size	Shaft Size
a) **Stacked Form**	$\phi^{0.6882}_{0.6875}$ LMC / MMC	$\phi^{0.6884}_{0.6880}$
b) **Referenced to Basic Size Form**	$\phi 0.6875\ ^{+0.0007}_{0}$	$\phi 0.6875\ ^{+0.0009}_{+0.0005}$

7. **What is the maximum *clearance*?** [1 Point] **ANSWER:** **0.0002**

$$maximum\ clearance = clearance\ at\ LMC = hole_{LMC} - shaft_{LMC}$$
$$= 0.6882 - 0.6880 = 0.0002$$

Note, get from fits data, then check from table above (e.g. stacked form)

8. **What is the maximum *interference*?** [1 Point] **ANSWER:** **0.0009**

$$maximum\ intereference = shaft_{MMC} - hole_{MMC} = 0.6884 - 0.6875$$
$$= 0.0009$$

Note, get from fits data, then check from table above (e.g. stacked form)

9. **What standard fit *category* is this system?** [1 Point]

ANSWER: **Location fit**

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Name:	Student Number:	Section:
AHMED M. EL-SHERBEENY, PHD	4	10 / 11

Given the following information for a shaft-hole system,

$$Nominal\ Size = 1.\frac{3}{4}"$$

$$LT5\ fit$$

Nominal Size Range, Inches Over	To	Class LT 5 Fit[a]	Std. Tolerance Limits Hole H7	Shaft n6
0 –	0.12	–0.5 +0.15	+0.4 0	+0.5 +0.25
0.12 –	0.24	–0.6 +0.2	+0.5 0	+0.6 +0.3
0.24 –	0.40	–0.8 +0.2	+0.6 0	+0.8 +0.4
0.40 –	0.71	–0.9 +0.2	+0.7 0	+0.9 +0.5
0.71 –	1.19	–1.1 +0.2	+0.8 0	+1.1 +0.6
1.19 –	1.97	–1.3 +0.3	+1.0 0	+1.3 +0.7
1.97 –	3.15	–1.5 +0.4	+1.2 0	+1.5 +0.8

1. **What is the basic size?** [1 Point] **ANSWER:** **1.7500"**

$BS = 1.\frac{3}{4}" = 1.7500\ in$ (note, answer must be expressed to **4 d.p.**)

2. **What is the shaft MMC?** [1 Point] **ANSWER:** **1.7513**

$MMC = BS + (+0.0013) = 1.7500 + 0.0013 = 1.7513$

3. **What is the hole MMC?** [1 Point] **ANSWER:** **1.7500**

$MMC = BS\ (since\ basic\ hole\ system) = 1.7500$

4. **What is the shaft LMC?** [1 Point] **ANSWER:** **1.7507**

$$LMC = BS + (+0.0007) = 1.7500 + 0.0007 = 1.7507$$

5. **What is the hole LMC?** [1 Point] **ANSWER:** **1.7510**

$$LMC = BS + (+0.0010) = 1.7500 + 0.0010 = 1.7510$$

6. **Express the hole and shaft sizes below in the specified formats** [$\frac{1}{2}$ pt. each]

	Hole Size	Shaft Size
a) **Stacked Form**	ϕ 1.7510 LMC / 1.7500 MMC	ϕ 1.7513 / 1.7507
b) **Referenced to Basic Size Form**	$\phi 1.7500\ ^{+0.0010}_{0}$	$\phi 1.7500\ ^{+0.0013}_{+0.0007}$

7. **What is the maximum *clearance*?** [1 Point] **ANSWER:** **0.0003**

$$maximum\ clearance = clearance\ at\ LMC = hole_{LMC} - shaft_{LMC}$$
$$= 1.7510 - 1.7507 = 0.0003$$

Note, get from fits data, then check from table above (e.g. stacked form)

8. **What is the maximum *interference*?** [1 Point] **ANSWER:** **0.0013**

$$maximum\ intereference = shaft_{MMC} - hole_{MMC} = 1.7513 - 1.7500$$
$$= 0.0013$$

Note, get from fits data, then check from table above (e.g. stacked form)

9. **What standard fit *category* is this system?** [1 Point]

ANSWER: **Location fit**