IE-352
Section 1, CRN: 13536
Section 2, CRN: 30521
First Semester 1432-33 H (Fall-2011) – 4(4,1,1)
MANUFACTURING PROCESSES - 2

Machining Exercises

Name:	Student Number:
	42

Answer ALL of the following questions [2 Points Each].

1. Let $n = 0.5$ and $C = 90$ in the *Taylor* equation for tool wear. What is the percent increase in tool life if the cutting speed is reduced by (a) 50% and (b) 75%?

2. Taking carbide as an example and using the equation for mean temperature in turning on a lathe, determine how much the feed should be reduced in order to keep the mean temperature constant when the cutting speed is doubled.

3. An orthogonal cutting operation is being carried out under the following conditions: $t_o = 0.1\ mm$, $t_c = 0.2\ mm$, width of cut $= 5\ mm$, $V = 2\ m/s$, $rake\ angle = 10°$, $F_c = 500\ N$, and $F_t = 200\ N$. Calculate the percentage of the total energy that is dissipated in the shear plane.

4. For a turning operation using a ceramic cutting tool, if the speed is increased by 50%, by what factor must the feed rate be modified to obtain a constant tool life? Use $n = 0.5$ and $y = 0.6$.

5. Using the equation for surface roughness to select an appropriate feed for $R = 1\ mm$ and a desired roughness of $1\ \mu m$. How would you adjust this feed to allow for nose wear of the tool during extended cuts? Explain your reasoning.