

Prince of Songkla University
The Faculty of Engineering

Midterm Examination Semester 1

Academic Year 2004

Date: 03/08/04

Time: 13.30-16.30

Subject: 227-501 Industrial Manufacturing Technology Room: R300

DIRECTIONS

1. Only short note on an A4-sheet (both sides), dictionaries and calculators are allowed.
2. 6 questions are included and must be done.
3. Total score is 80.
4. Your answers can be in English or Thai and written by pen or pencil.
5. Please check all questions before start working.

Dr. Angoon Sungkha-pong

ทูลจิตในการสอบ
โทษขั้นต่ำคือ ปรับตกในรายวิชานั้น และพักการเรียน
1 ภาคการศึกษา
โทษสูงสุดคือ ให้ออก

Supapan

1. From equation $\sigma = K\epsilon^n$ and the following given data:-

	n	K(Mpa)
Brass, annealed	0.33	800
Copper, annealed	0.54	315
Steel, low carbon annealed	0.26	530
304 stainless steel, annealed	0.45	1275

Question:

1.1) Calculate the true ultimate tensile strength of brass and copper. (10 points)

1.2) Calculate the true area at the onset of necking of Steel and 304 stainless steel. (10 points)

2. Describe the definition of following terms and show the examples for better explanation: -

2.1 Machining operation (3 points)

2.2 Interrupted Cutting Operation (3 points)

2.3 Continuous Cutting Operation (3 points)

2.4 Roughing machining (3 points)

2.5 Finishing machining (3 points)

3. List and explain the considerations involved in whether a cutting tool should be reconditioned or discarded? (10 points)

4. Using letting $n = 0.4$ and $c = 500$ and Taylor equation for tool wear, calculate the percentage increase in tool life if the cutting speed is reduced by 50 %.(10 points)

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5. An orthogonal cutting operation is being carried out under the following conditions:
depth of cut = 0.1 mm, width of cut = 5 mm, chip thickness = 0.2 mm, cutting speed = 2
m/s, rake angle = 10 deg., cutting force = 500 N, and thrust force = 200 N.

Question: Calculate the percentage of the total energy that is dissipated in the shear
plane during cutting. (15 points)

6. Manufacturing activities must be responsive to several demands and trends such as
design requirements & specification, economical method, productivity, ..., etc.

Question: As you are a manufacturing engineer, show your more essential demands
which you must be responsive to. (10 points)

***** Good Luck *****

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