

Prince of Songkla University
The Faculty of Engineering

Final Examination Semester 1

Academic Year 2004

Date : 31/07/04

Time : 9.00-12.00

Subject : 226-409 Production Technology III

Room : A201

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 50.
4. Your answers could be in English or Thai.
5. Please check all questions before start working.

Dr. Angoon Sungkha-pong

ทฤษฎีในการสอบ
โทษขั้นต่ำคือ ปรับตกในรายวิชานั้น และพักการเรียน
1 ภาคการศึกษา
โทษสูงสุดคือ ให้ออก

Supapa

1. Assume that the following data are taken from a high carbon steel tension test specimen. The original area of the specimen is 0.05 in^2 , final (fracture) area is 0.02 in^2 and original length is 2 in.

Load, P, (lb.)	Δ length
1200	0
2000	0.02
2500	0.08
3100	0.2
3800	0.4
4100	0.6
4200 (max)	0.86
2900 (fracture)	0.98

Question: 1.1) Compute true strain when the length of specimen is 2.4 in.

(5 points)

1.2) Compute true stress when the area of specimen is 0.035 in^2 .

(5 points)

2. From general characteristics of cutting-tool materials as shown in the following table.

Tool materials	A	B	C	D
Characteristics				
Hot hardness		increasing	→	→
Toughness	←	increasing	→	→
Chipping resistance	←	increasing	→	→
Thermal-shock resistance	←	increasing	→	→
Depth of cut	light to heavy	light to heavy	light to heavy	light to heavy

Question: What are the letter A, B, C, and D represent for? [Hint: IF 4 types of tool material are given-- HSS, CBN, Ceramics, and Carbides.] (5 points)

3. Explain why the cutting force F_c increases with increasing depth of cut and decreasing rake angle. (5 points)

Sapapan

4. Under what conditions would you discourage the use of cutting fluids? (5 points)
5. Describe the effects of tool wear on the workpiece and on the machining operation in general. (10 points)
6. A 300-mm long, 100-mm diameter titanium alloy rod is being reduced in diameter to 95 mm by turning on a lathe. The spindle rotates at 400 rpm, and the tool is traveling at an axial speed of 250 mm/min.
- Question: Calculate the cutting speed, material removal rate, time of cut and cutting force. (15 points)

*****THE END*****

Dejairan