Name _____ ID _____ Seat No. _____

KING MONGKUT'S UNIVERSITY OF TECHNOLOGY THONBURI

Final Examination

Second semester, Academic Year 2011

TEN 437 Metal Forming II — Tool and Materials Engineering

23 March 2011 — Time : 9:00 – 11:00

Instructions :

1. This examination paper contains 10 problems 5 pages including this page. (total of 40 marks)
2. Closed book examination, books are not allowed.

Dr.Varunee Premanond (Ext. 9209)

Instructor

This examination paper has been evaluated from department of Tool and Materials Engineering Department

(Assoc.Prof.Dilok Sriprapai)

Head of Department

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1. In metal forming, only rolling requires friction for the success of operation.
   1.1 Explain the benefit of friction in rolling process. (2 points)

1.2 How to obtain low friction or high friction in industrial practice? (3 points)

2. For **blanking** operation, comparing between blanking punch and blanking die, which one has higher rate of wear (Punch or Die)? Explain the reason to support your answer (3 points)

3. For **deep drawing** operation, comparing between punch and die, which one has higher rate of wear (Punch or Die)? Explain the reason to support your answer (3 points)

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4. Draw the pictures to show 3 regimes of lubrications; full film regime, mixed film regime and boundary regime. (3 points)

5. In hot forging operation, fatigue wear is the major problem. Recommend the methods to reduce fatigue wear. (3 points)

6. What are the benefits of aqueous lubricant (water based lubricant) over oil lubricant? (2 points)

7. What are the benefits of solid lubricant over liquid lubricant (2 points)

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8. Describe the necessities of using lubricant in the following process. (12 points)

8.1 Blanking process of steel sheet

8.2 Deep drawing process of stainless steel

8.3 V-Bending Process of Al-sheet

8.4 Wire drawing Process of steel wire

8.5 Hot Rolling Process of steel

8.6 Cold Forging Process of steel

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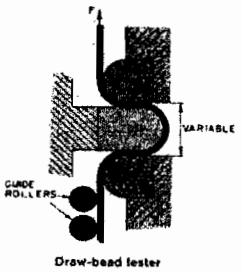
9. Explain the method and the result obtain from these following experiments ; (4 points)

9.1



Draw-bead tester

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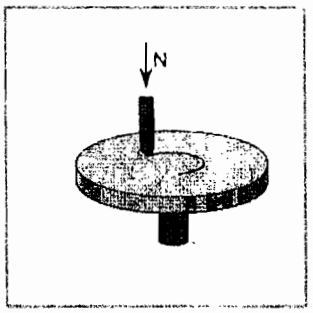
9.2



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10. How to measure wear on the tool? Describe 3 methods to measure wear on the blanking punch. (3 points)

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