

**PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING**

Midterm Examination : Semester 1

Academic year : 2007

Date : August 2, 2007

Time : 13.30-16.30

Subject : 226-314 Machine Tools Technology

Room : A 203

**ทฤษฎีในการสอบ โทษชั้นต่ำปรับตกในรายวิชานั้น
และพักการเรียน 1 ภาคการศึกษา**

Instruction :

- Answer all questions in the answer book.
- All notes, books and calculators are not allowed.
- Total score is 100 (45%).

Questions:

1. Why is the spindle of the lathe hollow? (3 marks)
2. What different kinds of surfaces can be produced by turning? (3 marks)
3. How does a turret lathe differ from an engine lathe? (4 marks)
4. What is the carriage? What are the components which make up the carriage? What is the purpose of each of the components? (6 marks)
5. Differentiate between live center, dead center and running center? (3 marks)
6. Describe four methods of locating the center of the stock before drilling a center hole. (4 marks)



7. What is the quick-change gear box? What is its function?
(3 marks)
8. What are the advantages and disadvantages of four-jaw independent chuck as contrasted with a three-jaw universal chuck? (4 marks)
9. Describe the procedure for testing a lathe to ensure that it will turn a true cylinder. (4 marks)
10. What is the reason for using a taper tap before a plug tap in tapping a hole? (3 marks)
11. A tapered piece is to be turned. It has an overall length of 10in. and a tapered section 6 in. long. The tapered section has a small diameter of 0.78 in. and a large diameter of 0.98 in. Find: (a) the taper per in.; (b) the taper per ft.; (c) the set-over; (d) the imaginary large diameter. (6 marks)
12. Given a work diameter of 3.6 in., a negative back rake of 12° , an end relief angle of 6° , and an offset of 0.062 in. above center. Calculate the effects of this offset on the various angles of the tool bit. (4 marks)
13. Given a $\frac{1}{2}$ -12 NC thread, calculate: (a) the pitch ; (b) the depth of the thread ; (c) the minor diameter of the screw ; (d) the tap drill size ; (e) the pitch diameter.($d = 0.6495p$) (6 marks)
14. Why is it good practice to set a compound rest at 29° in the threading operation? (3 marks)
15. Explain fully the process of setting a lathe for cutting threads (6 marks)
16. What is the basic purpose of a self-opening die head? (3 marks)
17. How does thread milling differ from thread turning? (3 marks)

18. Why has thread rolling become the most commonly used method for making threads? (3 marks)
19. Find the rpm of lathe spindle to turn a 2.5in.diameter piece of mild steel with a (a) high speed tool, (b) carbide tool. Assume a cutting speed of 90 fpm for HSS tool and 360 fpm for carbide. Also determine the time required to take one cut over the stock in both the cases, if the length of the work is 12 in. and the feed used is 0.005 inch per revolution. (6 marks)
20. What is the column of a milling machine? What is its use? (3 marks)
21. How does a universal milling machine differ from a turret universal milling machine? (3 marks)
22. How is a cutter positioned laterally on an arbor? (3 marks)
23. What is a staggered-tooth cutter? Why is it preferred to a plain milling cutter? (3 marks)
24. What is the purpose of an interlocking cutter? (3 marks)
25. What is the difference between conventional and climb milling? When is it proper to use each? (4 marks)
26. A 6 teeth 1.0 in.diameter end milling cutter is to be used to cut a 1.0 in.slot into a cast-iron block with a feed of 0.002 in./tooth. If the cutting speed is to be 90 fpm, the depth of the slot to be cut is 0.125 in. and the length of the work is 6.0 in., find : (a) the rpm ; (b) the time to take one cut. (4 marks)

Pichit Pitsuwan
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