PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Midterm Examination : Semester 1 **Academic year : 2009**
Date : July 27, 2009. **Time : 13.30-16.30**
Subject : 226-312 Machine Tools Engineering **Room : A 401**

ทุจริตในการสอบ โทษขั้นต่ำปรับตกในรายวิชานั้น
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. Describe the basic principle of cylindrical grinding, reaming and face milling operation. (6 marks)

2. What is a turret lathe? Differentiate between Saddle-type and Ram-type turret lathe. (3 marks)

3. What is the purpose of the saddle? What are the components which make up the saddle? What is the purpose of each of the components? (6 marks)

4. Describe the use of a drive plate for turning a long taper piece. (3 marks)

5. Describe a universal chuck and an independent chuck. How are they used? How do they differ? (3 marks)

6. Sketch a single point cutting tool and indicate all the angles. (3 marks)

7. Why may thin-wall tubing or long slender workpieces be more satisfactorily machined with decreased SCEA? (3 marks)

8. What is the difference between clearance angles and relief angles? (3 marks)

9. What is the major advantage of negative-rake inserts used in throwaway insert-type tools? (3 marks)

10. What are the advantages of the screw-, bridge-, and pin-type clamping mechanisms of tool holders? (3 marks)

11. What is the effect on the rake and relief angles of setting a turning tool too high above the center line of the work? Too low? (3 marks)

12. Describe the procedure for testing a lathe to ensure that it will turn a true cylinder. (3 marks)

13. A tapered piece is to be turned. It has an overall length of 16in. and a tapered section 10 in. long. The tapered section has a small diameter of 1.04 in. and a large diameter of 1.40 in. Find: (a) the taper per in.; (b) the taper per ft.; (c) the set-over; (d) the imaginary large diameter. (4 marks)

14. The offset of the tailstock may be accomplished in several ways, describe all of them. (3 marks)

15. Given a $\frac{1}{2}$-20 NF 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) (5 marks)

16. Describe the various methods used to turn a taper on a lathe.(5 marks)

17. Find the rpm of lathe spindle to turn a 4 in. diameter piece of work with a cutting speed of 100 fpm. Also determine the time required to take one cut over the stock if the length is 15 in. and the feed used is 0.025 in. per revolution. (4 marks)

18. Explain the fundamental structure of a turret milling machine. (3 marks)

19. How does a universal milling machine differ from a plain horizontal milling machine? (3 marks)

20. What is a rack milling attachment? What is its use? (3 marks)

21. What is the column of a milling machine? What is its use? (3 marks)

22. Describe the main parts of a milling fixture. (4 marks)

23. What are 3-2-1 locating points on a mill fixture ? (3 marks)

24. How does an angle milling cutter differ from a form milling cutter? (3 marks)

25. What is the purpose of a staggered-tooth milling cutter? (3 marks)

26. Describe the difference between a two-flute center-cutting end mill and a four-flute center-relieved end mill. (3 marks)

27. How does a Woodruff key seat cutter differ from a T-slot cutter? (3 marks)

28. In the selection of milling cutter, why should the cutter diameter be kept as small as possible? (3 marks)

29. Why does the action of a helical flute on a milling cutter provide smooth and continuous cutting? (3 marks)

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July, 2009