PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Midterm Examination : Semester 1   Academic year : 2011
Date : August 1, 2011.   Time : 13.30-16.30
Subject : 226-312 Machine Tools Engineering   Room : S 104

ทุจริตในการสอบ โทษขั้นต่ำปรับตกในรายวิชานั้น

และพักการเรียน 1 ภาคการศึกษา

Instruction :
- Answer all questions in the <u>answer</u> book.
- All notes, books and calculators are not allowed.
- Total score is 100 (50%).

Questions:

1. Describe the basic principle of knurling, planing, form turning, end milling and internal grinding operation.   (10 marks)

2. What is a tool room lathe? Differentiate between a tool room lathe and an engine lathe.   (3 marks)

3. Describe the two distinctive features of multi-spindle automatic lathe.   (4 marks)

4. What function is provided by the lead screw on a lathe that is not provided by the feed rod?   (3 marks)

5. What is the quick-change box? What is its function?   (3 marks)

6. Differentiate between a dead center, a live center and a running center.   (3 marks)

7. Describe the use of a split collet.   (3 marks)

8. What is a steady rest? A follower test? How are they used?   (3 marks)

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

10. What is the disadvantage of 0° lead angle?   (3 marks)

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

12. What are general rules for rake angles?   (3 marks)

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

14. What are the advantages of brazed carbide tools?   (3 marks)

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

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

17. A tapered piece is to be turned. It has an overall length of 18in. and a
    tapered section 10 in. long. The tapered section has a small diameter
    of 2.00 in. and a large diameter of 2.50 in. Find: (a) the taper per
    in.; (b) the taper per ft.; (c) the set-over; (d) the imaginary large
    diameter.   (4 marks)

18. What are the advantages and disadvantages of the taper attachment?
                                                              (3 marks)

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

20.Given a 1-16 NF thread, calculate: (a) the pitch ; (b) the depth of the thread ; (c) the pitch diameter; (d) the tap drill size ; (e) the root diameter of the screw.(d = 0.6495p) (5 marks)

21.Explain fully the process of setting a lathe for cutting threads. (4 marks)

22.Find the rpm of lathe spindle to turn a 3.6 in. diameter piece of work with a cutting speed of 120 fpm. Also determine the time required to take one cut over the stock if the length is 16 in. and the feed used is 0.010 in. per revolution.(over run allowance is 1.6 in.) (4 marks)

23.Explain the fundamental structure of a compound universal (turret) milling machine. (3 marks)

24.How does a duplex bed type milling machine differ from a plain milling machine? (3 marks)

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

26.Describe the main parts of a milling fixture. (5 marks)

27.What is the purpose of an interlocking milling cutter? (3 marks)

28.In the selection of milling cutter, why should the cutter diameter be kept as small as possible? (2 marks)

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

(2 marks)

Pichit Pitsuwan
July, 2011