

PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Final Examination : Semester 1

Academic year : 2007

Date : October 6, 2007.

Time : 9.00-12.00

Subject : 226-314 Machine Tools Technology

Room : R 201

ทูลรลทในการสอบ โทษขันต่าปรบตกลในรายวلمانัน และ พักการเรยน 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. Explain the difference between simple and differential indexing.
(3 marks)
2. Find the movement of the index handle when simple-indexing the following divisions: (a) 30; (b) 22; (c) 96; (d) 72; (e) 66. (5 marks)
3. Find the gears and the movement of the index handle needed to differential-index 233 divisions. (5 marks)
4. Find the movement of the index handle and the error necessary to index $39^{\circ} 59'$ using the approximate method. (4 marks)
5. A spur gear has 34 teeth and measures 3.0 in. in outside diameter. Find:
(1) the diametral pitch; (2) the pitch diameter; (3) the addendum;
(4) the dedendum; (5) the clearance; (6) the full depth of the tooth ;
(7) the working depth of the tooth; (8) the root diameter. ($c = 0.157/P$)
(8 marks)
6. What is the relationship between the diametral pitch and the module of a gear?
(3 marks)



7. What modification in design is made to herringbone gears to permit them to be cut by hobbing? (2 marks)
8. When a helical gear is machined on a milling machine, the table lead screw and the universal dividing head are connected by a gear train. Why? (3 marks)
9. What are the functions of the margins and the flutes on a twist drill? (4 marks)
10. Trepanning is one of the metal working industries most popular drilling methods. Why? (3 marks)
11. What is the rationale behind the operation sequence: center drilling - drilling - boring - reaming? (4 marks)
12. What are the primary purposes of reaming? (2 marks)
13. Suppose you specified a feed that was too large. What kinds of problems do you think this might cause? (2 marks)
14. What is the difference between machine reamer and hand reamer? (3 marks)
15. What are the advantages of shell reamers? (2 marks)
16. What is unique about broaching compared with the other basic machining processes? (2 marks)
17. For mass-production operations, which process is preferred, pull-up broaching or pull-down broaching? Why? (3 marks)
18. Explain why tooth spacing is important in sawing. (2 marks)



19. Describe three basic types of saw tooth forms. (3 marks)
20. Explain the principle and describe the procedure for cutting an angle on a bar stock on an upright cutoff band sawing machines ? (4 marks)
21. In filing describe the right type of cut for the material to be cut. (4 marks)
22. The shaper tool slide may be used to make angle cuts. Explain. (4 marks)
23. What are the unique characteristics of abrasive machining processes? (2 marks)
24. What are the abrasives requirements? Explain. (5 marks)
25. Why are the grade of a bond and the grain spacing important in grinding wheels? (4 marks)
26. What is the purpose of low-stress grinding? How is it done? (4 marks)
27. How does creep feed grinding differ from conventional surface grinding? (3 marks)
28. What are accomplished in dressing and truing a grinding wheel? (3 marks)
29. Describe the four basic types of surface grinding machines. (4 marks)

Pichit Pitsuwan
September, 2007.

