

**PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING**

Final Examination : Semester 1

Academic year : 2010

Date : October 4, 2010.

Time : 9.00-12.00

Subject : 226-312 Machine Tools Engineering

Room : S203

ทฤษฎีในการสอบ 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. Explain the difference between simple indexing and simple angular indexing. (3 marks)
2. Find the movement of the index handle when simple-indexing the following divisions: (a)50; (b) 70; (c) 78; (d) 82. (4 marks)
3. A spur gear has 62 teeth and measures 4.0 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. ($a = 1/P, c = 0.157/P$) (7 marks)
4. Explain the fundamental structure of a radial drill press. (3 marks)
5. Explain the fundamental structure of a multi-spindle drilling machine. (3 marks)
6. What are the functions of the margins and the flutes on a twist drill? (4 marks)

7. What is a BTA drill? (3 marks)
8. Trepanning is one of the metal working industries most popular drilling methods. Why? (3 marks)
9. What is the rationale behind the operation sequence: center drilling - drilling - boring - reaming? (3 marks)
10. How does a subland drill differ from a step drill? (2 marks)
11. What is the difference between a machine reamer and a hand reamer? (3 marks)
12. What is the difference between a drill jig and a fixture? (3 marks)
13. Why is it considered poor practice to clamp the part with the hinged plate of a leaf-type jig? (3 marks)
14. Explain the transmission of power from the bull wheel to the ram in a crank shaper. (4 marks)
15. How does creep feed grinding differ from conventional surface grinding? (3 marks)
16. Why are centerless grinders so popular in industry compared to center-type grinders? (3 marks)
17. What are the abrasives requirements? Explain. (3 marks)
18. Why are the grade of a bond and the structure (grain spacing) important in grinding wheels? (4 marks)
19. Describe the process of making silicon carbide. (3 marks)
20. What are the disadvantages of centerless grinding? (3 marks)



21. Why does CBN far surpass diamond as an abrasive in some applications? (2 marks)
22. How is abrasive grain size determined? (2 marks)
23. What are accomplished in dressing and truing a grinding wheel? (2 marks)
24. What is the difference between a tool and cutter grinder and a cylindrical center-type grinder? (3 marks)
25. What are the advantages of hydraulic-press drives? (3 marks)
26. What are the characteristics of single-reduction gear drive presses? (3 marks)
27. Describe the characteristic appearance of edges of parts produced by piercing and blanking. (3 marks)
28. Is the die clearance placed on the punch or die opening for a blanking operation? Why? (3 marks)
29. In sheet-metal piercing and blanking what is meant by penetration? (2 marks)
30. What determines the correct amount of die clearance? (3 marks)
31. What is the result of insufficient die clearance? (2 marks)
32. What methods are used to reduce cutting forces on a press? (2 marks)
33. What are the major advantages of compound dies? (3 marks)

Pichit Pitsuwan
September, 2010.

