

PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Final Examination : Semester 1

Academic year : 2009

Date : September 28, 2009.

Time : 9.00-12.00

Subject : 226-312 Machine Tools Engineering

Room : หัวหุ่น

ทูลิตในการสอบ โทษขันต่ำปรับตกลในรายวิชานัน
และพัทการเรียน 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 direct indexing. (3 marks)
2. Find the movement of the index handle when simple-indexing the following divisions: (a) 60; (b) 90; (c) 98; (d) 72; (e) 86. (5 marks)
3. A spur gear has 48 teeth and measures 2.5 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. What are the functions of the margins and the flutes on a twist drill? (4 marks)
5. What is the difference between a gang drill press and a turret drill press? (3 marks)
6. Explain the three motions which make the radial drill press more flexible than the standard drill press? (3 marks)

13. What is the advantage of tumble jigs? (3 marks)

14. Make a drawing of a shaper tool slide head and label all parts. (4 marks)

15. The shaper tool slide may be used to make angle cuts. Explain. (4 marks)

16. What are the advantages of using a shaper tool slide?

7. When a large diameter hole is to be drilled why is a small diameter hole often drilled first? (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. What are the primary purposes of reaming? (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. What is the advantage of tumble jigs? (3 marks)
14. Make a drawing of a shaper tool slide head and label all parts. (4 marks)
15. The shaper tool slide may be used to make angle cuts. Explain. (4 marks)
16. What are the abrasives requirements? Explain. (4 marks)
17. Why are the grade of a bond and the structure (grain spacing) important in grinding wheels? (4 marks)
18. Why is bonding material in grinding wheel very important? (3 marks)
19. How does creep feed grinding differ from conventional surface grinding? (3 marks)
20. What are the advantages of centerless grinding? (3 marks)

21. Describe the four basic types of surface grinding machines. (4 marks)
22. What are accomplished in dressing and truing a grinding wheel? (3 marks)
23. What is the difference between a tool and cutter grinder and a cylindrical center-type grinder? (3 marks)
24. What is meant by a single-, two-, or four-point suspension of a press? (3 marks)
25. Describe the characteristic appearance of edges of parts produced by piercing and blanking. (3 marks)
26. Is the die clearance placed on the punch or die opening for a blanking operation? Why? (3 marks)
27. In sheet-metal piercing and blanking what is meant by penetration? (3 marks)
28. What determines the correct amount of die clearance? (3 marks)
29. Why is die clearance increased for harder materials? (3 marks)
30. What methods are used to reduce cutting forces on a press? (2 marks)

Pichit Pitsuwan
September, 2009.