PRINCE OF SONGKLA UNIVERSITY

FACULTY OF ENGINEERING

Final Examination : Semester 1 Academic year : 2011

Date : October 3, 2011. Time : 9.00-12.00

Subject : 226-312 Machine Tools Engineering Room : S203

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 (50%).

Questions:

1. Explain the difference between direct indexing and simple angular indexing. (3 marks)

2. Find the movement of the index handle when simple-indexing the following divisions: (a) 30 ; (b) 37 ; (c) 64 ; (d) 86. (4 marks)

3. A spur gear has 40 teeth and measures 3.5 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. Explain the fundamental structure of a universal radial drilling machine. (3 marks)

5. Explain the fundamental structure of a turret drilling machine. (3 marks)

6. When a large-diameter hole is to be drilled, why is a small-diameter hole often drilled first? (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 spade drill differ from a twist drill? (2 marks)

11. What is the major difference between an expansion reamer and an adjustable reamer? (3 marks)

12. What are indexing jigs and how are they used? (3 marks)

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

14. Explain the transmission of power from the bull wheel to the ram in a crank shaper. (4 marks)

15. How does plunge-cut grinding differ from conventional cylindrical grinding? (3 marks)

16. Why are the advantages of centerless grinding? (3 marks)

17. What is the difference between a tool and cutter grinder and a cylindrical center-type grinder? (3 marks)

18. What are the abrasives requirements? Explain. (3 marks)

19. Why are the grade of a bond and the structure (grain spacing) important in grinding wheels? (4 marks)

20. Describe the process of making aluminum oxide. (3 marks)

21. Why is CBN superior to silicon carbide as an abrasive in some applications? (2 marks)

22. What is the relationship between grit size and surface finish? (2 marks)

23. What are accomplished in dressing and truing a grinding wheel? (2 marks)

24. What is meant by a single-, two-, or four-point suspension of a press? (3 marks)

25. What are the characteristics of double-reduction gear drive presses? (3 marks)

26. Describe the characteristic appearance of edges of parts produced by piercing and blanking. (3 marks)

27. Is the die clearance placed on the punch or the die opening? (3 marks)

28. In sheet-metal piercing and blanking what is meant by penetration? (2 marks)

29. What determines the correct amount of die clearance? (3 marks)

30. Describe the cutting action in punch and die operations. (3 marks)

31. To reduce cutting forces in a die, why is double shear preferred over single shear? (2 marks)

32. What is the difference between the feed distance and the advance distance of a progressive die? (2 marks)

33. What are the major advantages of compound dies? (3 marks)

Pichit Pitsuwan
September, 2011.